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MARCH 1959



CHEMICAL PROCESSING

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Ansul People Have Emotional Stake in New Products

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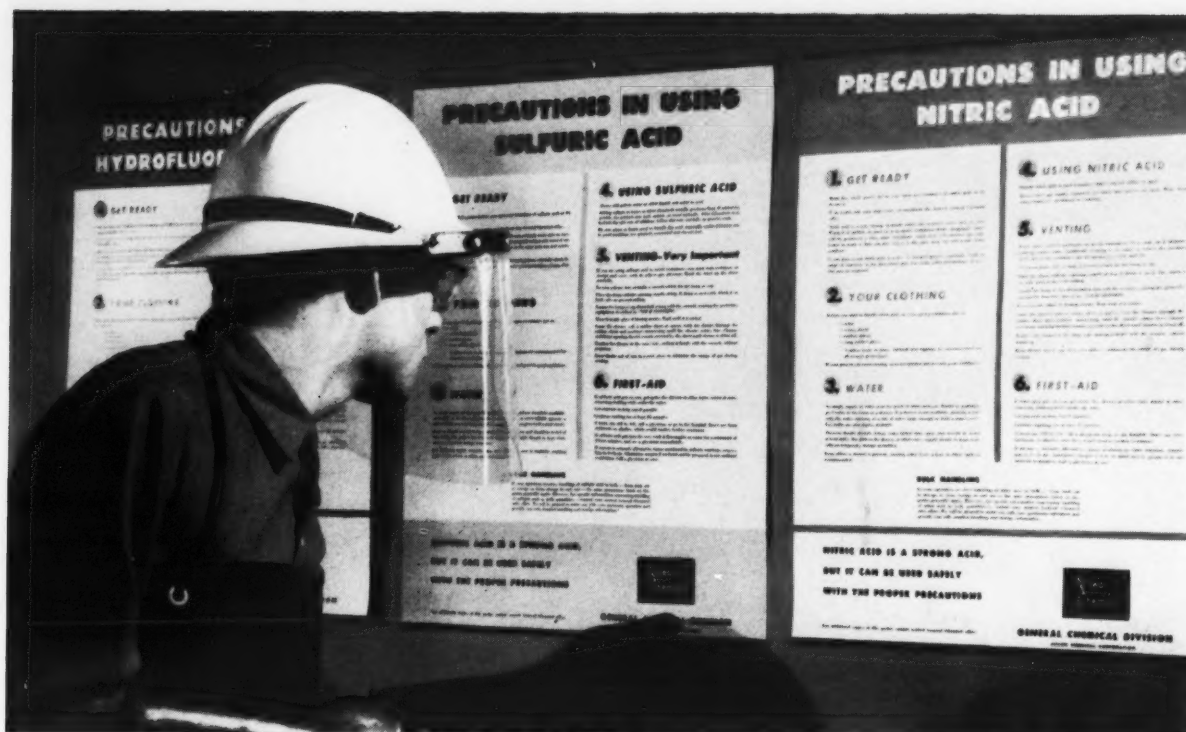
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CP-39

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☐ Precautions In Using Hydrofluoric Acid
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Title _____

Company _____

Address _____

City _____ Zone _____ State _____



GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

Check 4043 opposite last page



conventions
and exhibits

March 2. Louisville Federation of Paint & Varnish Production Clubs, Annual Symposium, Sheraton Hotel, Louisville, Ky.

March 2-6. Tenth Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Penn-Sheraton Hotel, Pittsburgh.

March 3-5. Commercial Chemical Development Association, meeting, Statler Hotel, New York.

March 13. American Institute of Chemical Engineers and the American Chemical Society, Sixth Annual Joint Technical Meeting, Lamar State College of Technology, Beaumont, Texas.

March 16-20. American Institute of Chemical Engineers, National Meeting, Chalfonte Haddon Hall, Atlantic City.

March 16-20. Eleventh Western Metal Exposition and Congress, Pan-Pacific Auditorium and Ambassador Hotel, Los Angeles.

March 16-20. National Association of Corrosion Engineers, National Meeting, Sherman Hotel, Chicago.

March 17-18. Manufacturing Chemists' Association, Air and Water Pollution Abatement Conference, Netherlands Hilton, Cincinnati.

March 31. American Institute of Chemical Engineers, Philadelphia-Wilmington Section, Seventh Annual All-day Meeting, University of Pennsylvania, Philadelphia.

March 31-April 2. 21st Annual American Power Conference, sponsored by Illinois Institute of Technology, Hotel Sherman, Chicago.

April 5-10. American Chemical Society, 135th National Meeting, Boston.

April 5-10. International Atomic Exposition, Public Auditorium, Cleveland.

April 10. American Institute of Chemical Engineers, Ohio, Pittsburgh, and Northern

... Meetings and shows of interest to the chemical industries

West Virginia Sections, Annual Joint One-day Symposium, Mellon Institute, Pittsburgh.

April 20-22. The American Oil Chemists' Society, Spring Meeting, Roosevelt Hotel, New Orleans.

April 29-30. Manufacturing Chemists' Association, Symposium on Packaging and Transportation of Chemical Products, Engineering and Scientific Center, Cleveland.

May 3-7. The Electrochemical Society, Inc., meeting, Sheraton Hotel, Philadelphia.

May 10-13. American Institute of Chemical Engineers, meeting, Kansas City, Mo.

May 14-23. International Petroleum Exposition, Tulsa, Oklahoma.

May 17. American Society for Testing Materials, Seventh Meeting on Mass Spectrometry, Statler Hilton Hotel, Los Angeles.

June 1-5. Fifth World Petroleum Congress Exposition, Coliseum, New York.

June 9-12. The Material Handling Institute's Exposition of 1959, Public Auditorium, Cleveland.

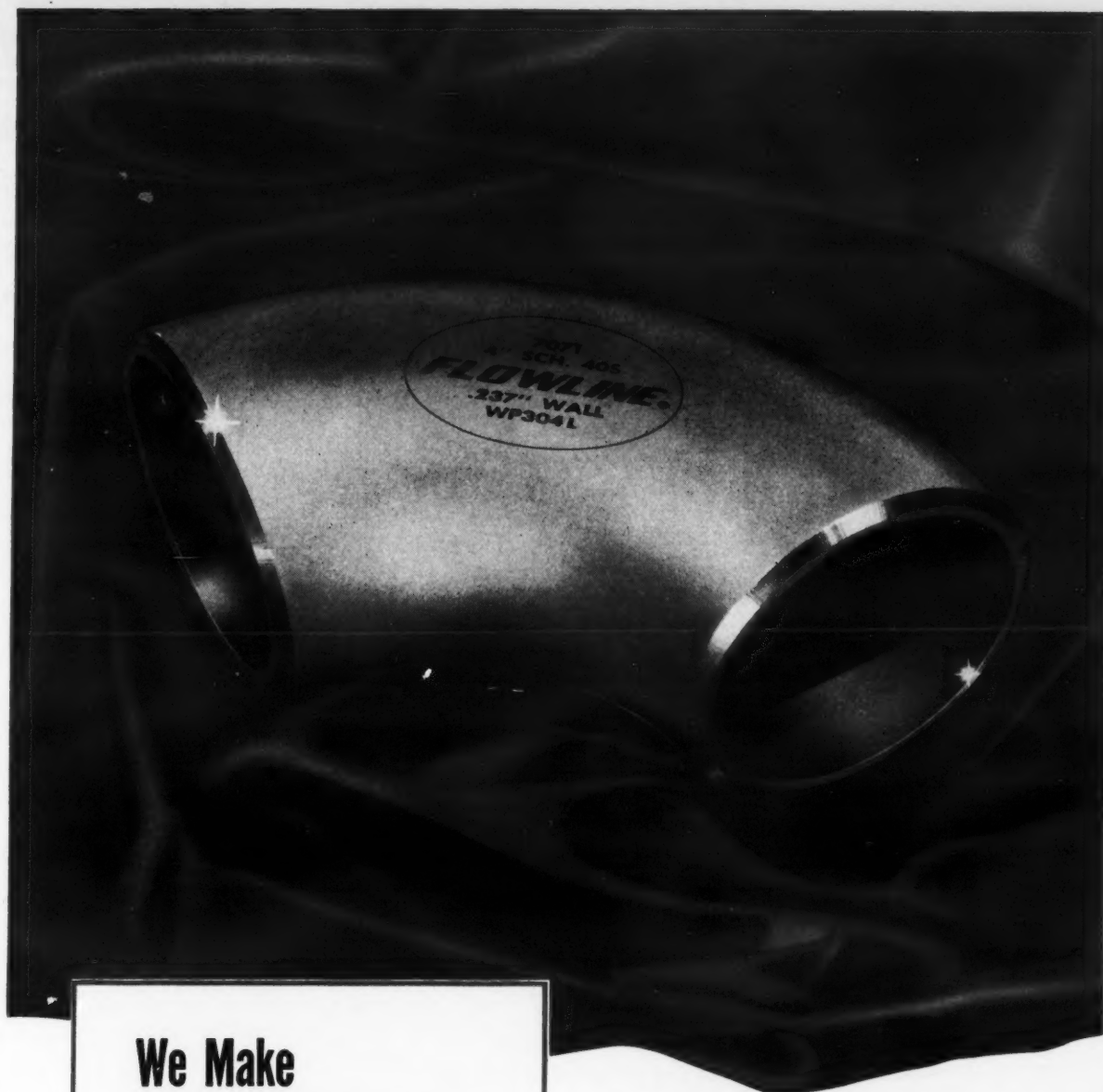
June 10-12. Instrument Society of America, Second International Symposium on Gas Chromatography, Kellogg Center for Continuing Education, East Lansing, Michigan.

June 22-24. American Society of Refrigerating Engineers, Annual Meeting, Lake Placid Club, Lake Placid, New York.

September 13-18. American Chemical Society, National Meeting, Atlantic City.

September 21-25. 14th Annual Instrument-Automation Conference and Exhibit, International Amphitheatre, Chicago.

September 27-30. American Institute of Chemical Engineers, meeting, St. Paul, Minnesota.



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CHEMICAL PROCESSING

with which is combined
CHEMICAL PROCESSING PREVIEW
and Chemical Business

For the management team

More than 50,000 copies of this issue

Vol. 22

March 1959

No. 3

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OTHER SUBSCRIPTIONS — from "non-qualified" persons (those who are not key processing men in the chemical industries) — are accepted at \$1.00 the copy, or \$10.00 the year. Foreign subscriptions — subscriptions from countries outside the territory of the United States and its possessions are acceptable at \$35.00 per year. Such subscriptions are not counted as "industry circulation" on BPA audit reports.

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CHEMICAL PROCESSING



over the editor's
shoulder



Comical Reactions

"We are growing serious and, let me tell you, that's the very next step to being dull." Although our intent is serious — to provide you with the news of the industry, its products and services, and to help you solve processing problems — our very next step, contrary to Addison's portent, is not toward dullness.

To keep from taking this step in the wrong direction, the editors of CP began using cartoons back in November 1954. Admittedly, the first efforts, staff-originated and usually staff-drawn by dubious artistic talent, were modest and hardly of "Punch" or "New Yorker" quality. But they were a step in the right direction.

A giant stride in that direction was taken in February 1956 with the appearance of the first professionally done cartoon. The same issue carried the first request for reader-submitted cartoons.

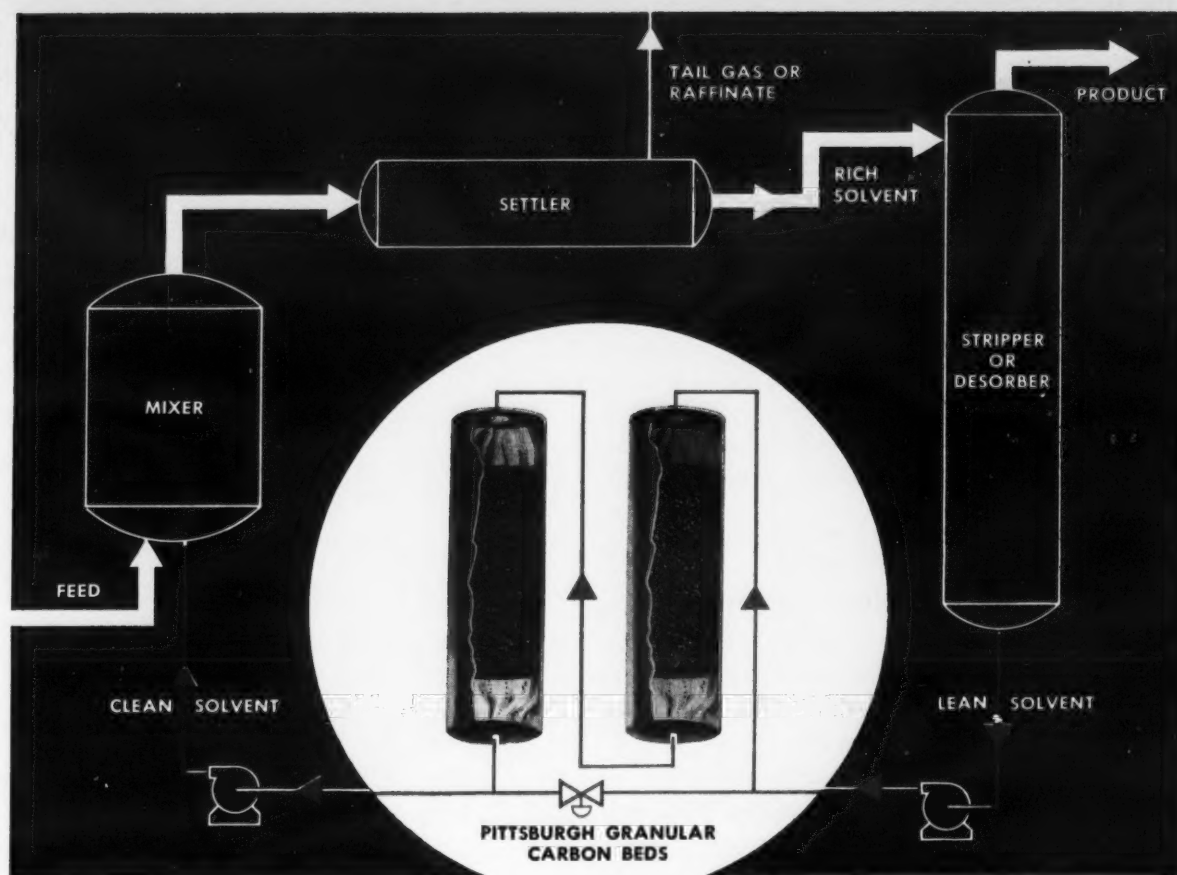
Since then we've received hundreds of cartoons each month. From these hundreds of contributions we try to pick those which we think will tickle your fancy the most. And some of the funniest come from you readers. Why? Primarily because they're based on incidents experienced in the chemical processing industry.

Cartoons have become a permanent feature of CP, not only because they prevent all of us from taking ourselves too seriously, but because you like them and look for them in each issue. We've had many requests to reprint them.

A sage Scotsman once said, "The humorist's like a man firin' at a target — he doesn't ken whether he hits it or no till them at the target tells 'im." But we do care. We hope the comical aspect of CHEMICAL PROCESSING hits the target with you. And whether it does or not, you'll tell us, won't you?

John C. Stevens

Assistant Editor



Improve Solvent Extraction and Absorption Efficiency with PITTSBURGH ACTIVATED CARBON

Does your process utilize acids, alkalis, amines, glycols or other costly solvents which must be re-circulated for repeated use? If so, you can maintain higher solvent selectivity and efficiency, and eliminate sewerage a side stream by circulating the solvent through a bed of PITTSBURGH Granular Activated Carbon.

In butadiene manufacture, for example, PITTSBURGH Activated Carbon is used to reduce the accumulation of organic contaminants in a recirculating stream of cuprous ammonium acetate.

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1. Increased selectivity and capacity of the solvent.
2. Reduced solvent make-up or cost of reclaiming.
3. Elimination of foaming in evaporators or distillation towers.
4. Reduction of corrosion and maintenance.
5. Improvement of quality of end product.

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* * *

Send for Booklet

Describes types and various applications of PITTSBURGH Activated Carbons in both liquid and vapor phase adsorption. For your free copy, write to Dept. E.



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highlights

**CHEMICAL
PROCESSING**

MARCH 1959

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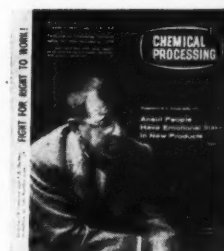
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Barbara Bammel

THIS MONTH'S COVER

Employees at Ansul Chemical Company are made to feel that management urgently needs their best creative efforts. Because of management philosophy that "People Support What They Help Create," Ansul has fostered development of skills existing within company. Robert C. Hood, Ansul's president, tells on page 27 how employees work together on product planning procedure to give management more confidence in all new product predictions.



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SPECIAL READER SERVICES

• For more information on articles and advertisements in this issue, check the Reader Service slip opposite last page

• To subscribe to this magazine see reader-qualification form opposite last page

Iron Curtain Aromatics

Following are two comments received on article by O. V. Tracy, "Iron Curtain Aromatics," which appeared on page 25 in CP's February issue.

Dear Sir:

I am in full agreement with Mr. Tracy's statement that cut-rate competition from behind the Iron Curtain poses a serious current and long-range problem for U. S. marketers of benzene and naphthalene.

In my own mind I have considerable doubt, however, that the Iron Curtain countries engage in this type of exporting merely for economic reasons. Everything Russia, for instance, does in this area seems to be tied in with its political objectives, and if it can gain economically on one hand and undercut American industry on the other, it accomplishes a dual purpose.

The Russian government's magazine, "Soviet Export," bluntly states: "The foreign trade policy of the U. S. S. R. is a component part of its foreign policy. . ." Furthermore, Nikita Khrushchev is outspoken in stating that Russian-produced materials are weapons in Russia's war against the West.

It seems to me inconsistent that we are spending \$40 billion plus for defense against Communism and additional billions to assist other free countries of the world in fighting the Communist threat while at the same time we allow Iron Curtain country goods to flow into the United States without any trade restrictions.

Mr. Tracy has performed a service by bringing this condition once again to the attention of industry and it is a situation that warrants much further discussion not only in industry but in government.

F. L. BYROM

Vice President
& General Manager

Tar Products Division
Koppers Company, Inc.

Two ways of providing EXPOSURE PROTECTION



TOO LATE ▲

to prevent serious heat exposure, a valiant attempt is made by firefighters to prevent rupture of tankage, not already involved in flames, with relatively ineffective hose streams.

GRINNELL WATER SPRAY SYSTEM ▶

shown under test at the Marietta, Ohio plant of the Bakelite Union Carbide Plastic Company, a division of the Union Carbide Corporation. Water - when it is applied in time and distributed over the surfaces efficiently by a properly engineered system - is most effective in limiting tank fires and controlling their spread.



Proper safeguards are uppermost in importance in protecting tanks which contain gases and flammable liquids in the event of fire. For example, tanks must be guarded against extreme heat exposure. Leaking gas, if it should develop, must be diluted to the point where it will not burn. And fire, if it should occur, must be localized and controlled or extinguished.

With a Grinnell Water Spray System, you get protection against all these eventualities.

Before heat raises tank temperatures dangerously, an enveloping spray of water provides instant cool-

ing, reducing internal pressure which helps prevent rupture. In addition, air turbulence is created (even in still air) which, in conjunction with the water vapor from the spray, helps dilute the flammable vapors controlling or extinguishing the fire. Flammable products which cannot be safely extinguished can be burned off under the protecting water spray with no damage to adjacent protected equipment.

There is a Grinnell Fire Protection System for every fire hazard. Call on Grinnell for advice about the one suited to your needs. Grinnell Company, Inc., 277 West Exchange Street, Providence 1, R. I.

GRINNELL FIRE PROTECTION SYSTEMS SINCE 1870



Check 4047 opposite last page

LETTERS

Dear Sir:

Mr. Tracy's article brings to the fore a problem vital not only to the American chemical industry but also to the entire American economy; namely, how can American products compete in our own country with those produced and offered by Iron Curtain countries where price of product is not determined by cost of production but rather by the political and economic aims and policies of government?

Presently, American industry is as much at a disadvantage in competing against Iron Curtain industry as a boxer complying with the known rules of boxing would be fighting an opponent who continually hit below the belt.

As Iron Curtain economy progresses toward its goals, American industry and American economy will suffer more and more unless proper safeguards, such as the establishment of realistic tariffs, the setting of quotas, or the adoption of other restrictive measures are taken. Unfortunately, many of the responsible officials of our government apparently are unaware of the gravity of this problem.

C. B. EDWARDS

President

Reilly Tar & Chemical Corporation



New Swenson Crystallizer produces 100 tons of high-grade potassium chloride crystals a day.

Forward Step in KCl Crystallization

A new Swenson Crystallizer is helping the National Potash Company of New Mexico make KCl (potassium chloride) crystals of the desired size and of exceptional uniformity. The operation is simple and stable. Downtime is minimized due to an unusually long boil-out cycle.

Swenson Crystallizers are designed to meet your requirements, both as to construction materials and capacity. New technical paper gives valuable facts. Send for it today. Swenson Evaporator Company, 15667 Lathrop Avenue, Harvey, Illinois.

75TH YEAR

87 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

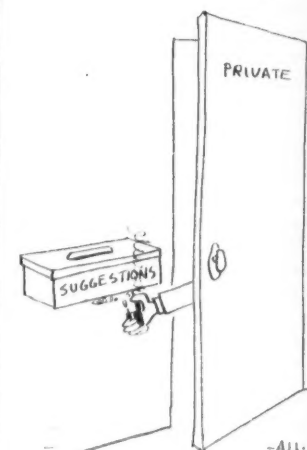
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Proved Engineering for the Process Industries Since 1889



WHITING—MANUFACTURERS OF CRANES, TRAMBEAM HANDLING SYSTEMS, TRACKMOBILES, FOUNDRY and RAILROAD EQUIPMENT

Check 4048 opposite last page



CHEMICAL PROCESSING

Paper Industry Shifts Into High; Upturn Seen in W. Va. Pulp's Net

WILLIAM R. WHITE, Market Analyst
Hornblower & Weeks

Scientific research has contributed immensely to American economic progress in recent decades. It is difficult for investors and consumers to understand the importance of chemical laboratory contributions to development and introduction of new products that account for growth in sales and earnings of many industries.

Vigorous expansion of paper and paperboard container production, accompanied by a phenomenal rise in per capita consumption, may be attributed primarily to discovery and perfection of new types and uses for paper products in consumer markets.

Impetus to Increase

Development of materials that have enabled container manufacturers to displace almost completely textile bags and wooden boxes has given special impetus to the paper industry's rapid gains. Still further progress is anticipated due to the recent introduction of stretchable kraft paper for use in multi-wall sacks and grocery bags. Tests have demonstrated this paper can provide substantial savings through prevention of loss from container breakage.

Two Pioneered Clupak

The knack of imparting elasticity to paper was developed by Cluett, Peabody & Company and West Virginia Pulp and Paper Company. The patented process and "Kraftsman Clupak" trademark have been assigned to Clupak, Inc., owned jointly by the two companies which pioneered the project.

Production of extensible kraft has been conducted on a commercial basis by West Virginia Pulp for more than a year. Several other paper companies, licensed to use the process on a royalty basis, are expected to begin production this year.

By elasticizing, paper can be given a quality capable of stretching 25 percent more than ordinary paper and having five times as much strength. The new type paper thus far is limited to kraft. It commands a premium price of about 7½ percent because it can offer so many advantages.

Decided economies are achieved by converters. Trade authorities are confident that a market for at least a million tons annually can be developed in a few years.

West Virginia Pulp

West Virginia Pulp is winding up an expansion and diversification program begun about six years ago. It was featured by acquisition of Hinde & Dauch, a sizable producer of paperboard containers.

Capital expenditures on modernization and improvement of facilities appear likely to drop significantly this year from an indicated total of about \$34 million last year. Net profit should prove more satisfactory in 1959 than the \$1.78 a share reported for the fiscal year ended October 31, 1958.

Dividends currently are being paid at a rate of \$1.20 annually, a reduction from \$1.60 a year last summer.

(For further information on stocks of companies in the chemical processing and allied fields write Hornblower & Weeks, 40 Wall St., New York 5, N. Y.)

Check 4049 opposite last page.

Another packaging advance by Continental the new **HI-STACKER** utility can with reversible spout



- Saves time, space, filling and shipping costs
- Simple to palletize
- I.C.C. approved

Continental's new, Dome-top HI-Stacker makes every inch of shipping, storage and display space count. It's easy to fill, easy to handle. Filler openings are available to fit your requirements. For further details, ask your Continental man.

REVERSIBLE SPOUT RIDES SAFELY, ATTACHES EASILY



Spout remains inverted during shipment and storage. To pour, spout is reversed — ready for fast, smooth dispensing. Spout remains in fixed position until container is empty.



Looks like Continental's famous Dome-top utility can (at left). Has all its sales features. Completely redesigned to save space and money.

CONTINENTAL  CAN COMPANY

Eastern Div.: 100 E. 42nd St., New York 17
Central Div.: 135 So. La Salle St., Chicago 3

Pacific Div.: Russ Building, San Francisco 4
Canadian Div.: 5595 Pare St., Montreal, Que.

Check 4050 opposite last page



Spotlight On People

HERBERT HOOVER JR., son of the 31st President and former Under Secretary of State, is elected a director of Monsanto Chemical Company.

Five new members are elected to board of Hercules Powder Company. They are EDWARD G. CRUM, general manager, Virginia Cellulose Department; G. FRED HOGG, general manager, Naval Stores Department; DR. JOHN H. LONG, general manager, Paper Makers Chemical Department; HENRY A. THOURON, general manager, Synthetics Department; J. H. TYLER McCONNELL, secretary of the company.

DR. RALPH L. HERBST JR. joins Pennsalt Chemicals Corporation as supervisor of market development.

At Nuodex Products of Canada, Limited, WILLIAM B. BATE, who had been president, is elected board chairman; G. H. CLIFFORD SMITH, previously executive vice president, is elected president, and JOHN F. LANG, vice president in charge of commercial development, is named executive vice president.

HARRY C. WECHSLER is appointed a vice president of Borden Chemical Company.

In readjustment of management at Vitro Corporation of America, FRANK B. JEWETT JR. is elected executive vice president, and WILLIAM B. HALL is made a vice president. Mr. Hall, who has been president of Vitro Uranium Company, assumes charge of Vitro companies engaged in chemical and metallurgical operations.

RICHARD C. WELLS is elected an executive vice president of Freeport Sulphur Company, and WILLIAM B. PORTERFIELD JR. is elected assistant vice president. Mr. Wells will continue as president of National Potash Company, a jointly owned subsidiary.

In the newly created Industrial Chemicals Division of Shell Chemical Corporation, E. S. ROBB is appointed manager of manufacturing; K. R. FITZSIMMONS, manager of mar-

PRODUCT OR PROCESS

a General Mills **Fatty Nitrogen*** Chemical may improve it!

General Mills—FATTY NITRILES RCN

Product	Description	Percent Nitrile (Minimum)	Iodine Value
Alitrite 21D	distilled coconut oil nitrile	95	16 max.
Alitrite 7D	distilled stearyl nitrile	95	5 max.

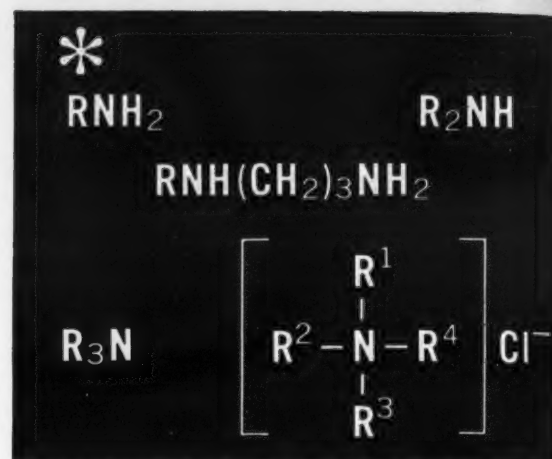
General Mills—FATTY PRIMARY AMINES RNH₂

Product	Description	Primary Amine Content (%) (Minimum)	Amine Number (Minimum)	Iodine Value
Alamine 4	primary lauryl amine	87	270	2 max.
Alamine 4D	distilled primary lauryl amine	97	294	2 max.
Alamine 6	primary palmityl amine	87	207	3 max.
Alamine 6D	distilled primary palmityl amine	97	222	3 max.
Alamine 11	primary oleyl amine	87	189	70 min.
Alamine 11D	distilled primary oleyl amine	97	203	70 min.
Alamine 21	primary coconut oil amine	87	250	16 max.
Alamine 21D	distilled primary coconut oil amine	97	272	16 max.
Alamine 26	primary tallow amine	87	192	43-50
Alamine 26D	distilled primary tallow amine	97	207	43-50
Alamine H26	primary hydrogenated tallow amine	87	192	6 max.
Alamine H26D	distilled primary hydrogenated tallow amine	97	207	6 max.
Alamine 7	primary stearylamine	87	186	6 max.
Alamine 7D	distilled primary stearylamine	97	202	6 max.
Alamine 33	primary cottonseed oil amine	87	192	65 min.
Alamine 33D	distilled primary cottonseed oil amine	97	207	65 min.
Alamine 34	primary soybean oil amine	87	192	85 min.
Alamine 46	mixed amines	60	150	20 min.

General Mills—FATTY SECONDARY AMINES R₂NH

Product	Description	Secondary Amine Content (%) (Minimum)	Iodine Value
Alamine 221	secondary coconut oil amine	85	16 max.
Alamine H226	secondary hydrogenated tallow amine	85	12 max.

*mg KOH equivalent to 1 gram of amine



Above left, fatty primary amine; above right, fatty secondary amine; center, fatty diamine; lower left, fatty tertiary amine; lower right, fatty quaternary ammonium chloride.

General Mills—N-FATTY 1, 3-PROPYLENE DIAMINES RNH(CH₂)₃NH₂

Product & Description	Amine Number	Water Content	Melting Range
Diam 21 N-coco 1, 3-propylene diamine	375 min.	2% max.	20-25°C
Diam 21D Distilled N-coco 1, 3-propylene diamine	390 min.	2% max.	25-30°C
Diam 26 N-tallow 1, 3-propylene diamine	285 min.	2% max.	43-47°C

General Mills—FATTY QUATERNARY AMMONIUM CHLORIDES RN(CH₃)₃⁺Cl⁻ or R₂N(CH₃)₂⁺Cl⁻

Product	Description	Percent Quaternary Ammonium Compound	Percent Sodium Chloride	pH
Aliquat 4	lauryl trimethyl ammonium chloride	48-52	1 max.	9 max.
Aliquat 6	palmityltrimethyl ammonium chloride	48-52	1 max.	9 max.
Aliquat 21	coco trimethyl ammonium chloride	48-52	1 max.	9 max.
Aliquat 26	monotallow trimethyl ammonium chloride	48-52	1 max.	9 max.
Aliquat 221	dicoco dimethyl ammonium chloride	73-77	0.5 max.	9 max.
Aliquat H226	dihydrogenated tallow dimethyl ammonium chloride	73-77	0.5 max.	9 max.
Aliquat 400	1:1 mixture Aliquats 26 and 221	48-52	1 max.	9 max.

General Mills—FATTY AMINE ACETATES RNH⁺CH₃COO⁻

Product	Description	Amine Value (Minimum)	Percent Neutralization	Iodine Value
Alamac 21	primary coconut oil amine acetate	191	97-103	10 max.
Alamac 21D	distilled primary coconut oil amine acetate	204	97-103	10 max.
Alamac 26	primary tallow amine acetate	154	97-103	35-45
Alamac 26D	distilled primary tallow amine acetate	164	97-103	35-45
Alamac H26	primary hydrogenated tallow amine acetate	152	97-103	5 max.
Alamac H26D	distilled primary hydrogenated tallow amine acetate	162	97-103	5 max.
Alamac 7D	distilled primary stearylamine acetate	159	97-103	5 max.

General Mills Fatty Nitrogen Chemicals can answer your requirements as:

corrosion inhibitors in crude oil production, oil refining and transportation and in secondary oil recovery. *Diamines and quaternary ammonium compounds* are used extensively in the petroleum industry.

flotation agents in recovery of phosphate, feldspar, potash, mica and quartz ores. *Primary amines* adsorb on the minerals, providing an hydrophobic film that enables attachment to air bubbles, floating minerals to the surface.

mold release agents for hard rubber curing. *Primary amines* speed curing and reduce permeability of hard rubber products such as battery boxes.

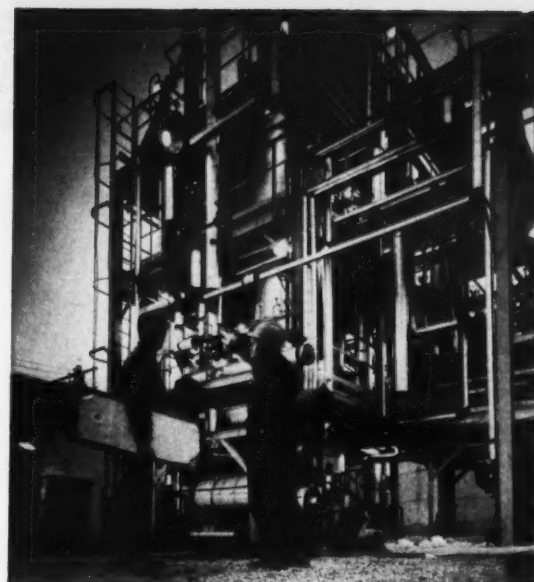
textile softeners for both home and commercial laundries. *Quaternary ammonium chlorides* soften fabrics, minimize static, speed the rate of dry, make ironing easier.

petroleum additives in engine fuels, lubricating and fuel oils. *Primary amines* and *diamines* prevent the formation of sludge and color bodies.

And *all* these fatty nitrogen chemicals are now being used in the chemical industry as reactive intermediates.

These are only a few proven applications of Fatty Nitrogen Chemicals. Your own experience and product requirements should suggest countless others. For a closer look at our complete line of on-stream Fatty Nitrogens, see the product specifications on the page at left.

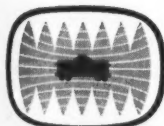
Whether yours is a product or a process, write today for your FREE booklet, Fatty Nitrogen Derivatives.
Address: Dept. 128,



Modern equipment like this is used in one stage of the production of fatty nitrogen chemicals to supply growing industrial demands. Shipped in 4,000 and 8,000 gallon tank cars, in 3,500 gallon tank trucks, and 55 gallon drums, these chemicals are controlled for minimum variation and maximum purity.

These key properties make Fatty Nitrogens extremely promising in many industries:

- ✓ **SURFACE FILMING**—Fatty nitrogen derivatives adsorb on metal as a monomolecular film and protect the metal from corrosive environment.
- ✓ **SELECTIVE ADSORPTION**—Fatty amines preferentially adsorb on certain non-metallic mineral surface; this surface modification enables the separation of ore components.
- ✓ **CHEMICAL REACTIVITY**—The fatty nitrogen derivatives are unique building blocks for organic chemical synthesis.
- ✓ **SOLUBILITY**—The fatty nitrogen derivatives have characteristic solubilities in a wide variety of polar and non-polar solvents.
- ✓ **SURFACE ACTIVITY**—The fatty nitrogen derivatives are cationic emulsifiers, wetting agents and detergents.
- ✓ **BIOCIDAL ACTIVITY**—The fatty nitrogen derivatives inactivate certain bacteria, fungi and algae.
- ✓ **BASE EXCHANGE**—The fatty nitrogen derivatives can replace inorganic ions in clays to make the clays compatible with organic liquids.
- ✓ **LUBRICITY**—Fatty nitrogen derivatives, electrochemically adsorbed on fibers and fabrics, lubricate the individual fibers and confer softness.



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CHEMICAL DIVISION
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Fatty Nitrogen Derivatives • Deriphat Amphoteric Surfactants • Sterols

Almacs, Aliquats, Diams, Deriphats, Alltriles and Alamines are trade names of General Mills



PEOPLE

keting, and D. L. YABROFF, manager of research and development.

At Interchemical Corporation, FRED A. WEYMOUTH, formerly division vice president of the Printing Ink Division, is designated a vice president. JAMES E. RENSON is appointed director of market research. At the company's International Division, FRANCIS A. E. SPITZER is appointed division president.

JAMES I. HARPER is appointed coordinator of chemical manufacturing and sales for Sun Oil Company. He also is president of the recently organized Sun-Olin Chemical Company.

HAROLD G. SHELTON, formerly director of marketing, is appointed general manager of Dyestuff & Chemical Division of General Aniline & Film Corporation.

At Jefferson Chemical Company, R. E. WERLEY JR. is appointed sales manager.

GEORGE M. TAYLOR heads up sales of "Penton," new chlorinated polyether plastic, for Hercules Powder Company.

In realignment of sales organization of Allied Chemical International, WALTER D. HOAG becomes director of sales for Eastern Hemisphere and EDWARD R. OSWALD sales chief for Western Hemisphere.

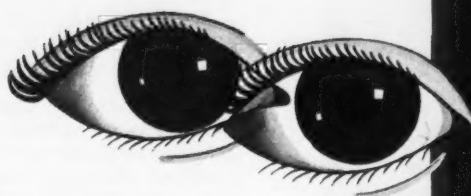
Victor Chemical Company promotes GLENN FITE to sales manager and names DONALD L. JOHNSON, formerly sales manager, to be trade relations assistant to vice president and director of sales.

NORMAN J. HARRIS is named sales manager for Archer-Daniels-Midland Company's plastics department.

In changes at American Cyanamid Company, Dr. T. F. COOKE is appointed commercial development manager for Organic Chemicals Division, and RICHARD M. GODDARD becomes manager of process chemicals department. E. K. HUNT is named to newly created post of merchandising manager and H. C. MILTON is appointed to succeed him as sales manager of the Plastics and Resins Division.

Check 4051 opposite last page

LOOK TWICE




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it's a**

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Of course it pays to make sure of your cylinder quality! And by specifying Harrisburg you benefit from over 50 years of leadership in the manufacture of fine seamless steel cylinders.

This leadership — and your guarantee of quality — is sustained through closely controlled production of a superior cylinder design. The location of heavy wall sections at points of maximum stress where they are most needed is made possible only by Harrisburg's hot drawing process, which produces rugged cylinders whose service life ranges up to thirty years.

Processes such as these insure your investment in cylinder utility and safety. When buying cylinders, look for Harrisburg  quality.

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TRANSPORTS



FLANGES



COUPLINGS

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Watching Washington

Congress Unlimbering Guns for Probe of Drug Industry

"Put the blame on big business" may well be the theme song of the 86th Congress—the blame for inflation, the high cost of living and the decline of small business.

As the Democrat-laden Congress accelerates its drive against bigness in business, concern is being felt that even if legislation passed is of a minor nature, prevailing anti-business sentiment in the House and Senate may broaden into public sentiment outside the Capitol.

The "investigation" is more in vogue now than ever, and the CPI hasn't escaped Congressional sleuths.

Hammering away as he's done in the past is Senator Estes Kefauver (D., Tenn.). As chairman of the Senate Anti-trust Subcommittee, he is pursuing the theory that the "high cost of living . . . is due in no small part to the upward manipulation of prices by big companies in administered price industries."

Target of a major inquiry will be the drug industry, particularly manufacturers of antibiotics. Armed with the Federal Trade Commission's tome on antibiotics production (WW, October 1958), the staff has worked for several months gathering ammunition for hearings.

Investigators Active

Investigators have been "in the field" collecting statistics and background data. Drug manufacturers, government personnel involved in drug research and development, and possibly other interested groups will air their views before the committee.

The Senate group hopes to come up with answers to such questions as:

1. What does it cost a company to produce a drug, including the cost of research?
2. How does government research fit into the picture?
3. How much does this re-

search cost the taxpayer and is this taken into consideration when the manufacturer prices his drugs?

4. How much does labor cost?
5. What does the drug wholesale at?
6. What profits accrue to the manufacturer?

A spokesman for the subcommittee told CHEMICAL PROCESSING that retail drug organizations are expressing concern over the probe, but they are being assured that the committee is not interested in this phase of the drug business.

Two Agencies Involved

After studies are compiled on a number of industries, and views of economists are weighed, the Justice Department and the FTC will be called upon to answer the question: "Are any of the practices described in violation of present law?"

If yes, that's the enforcement agency's problem. If no, the Senate committee wants its views on what should be done regarding specific practices, such as should existing laws be amended. Its recommendations will be taken into consideration before general legislative plans are made.

According to Kefauver, this does not mean the government will get the power to fix and regulate prices and wages.

Kefauver is out to make a strong case against drug makers. Even if no general legislation affecting all industry results from these price hearings, the fact alone that drug makers are under scrutiny

can do the industry no good.

While Congress scrutinizes, the FTC's case against antibiotics makers gets under way in New York and Washington. This is the beginning of what promises to be a long hassle between FTC and six antibiotics makers charged with price fixing (WW, October, 1958).

As if they haven't enough troubles, drug manufacturers also stand a chance of getting sniped at at the local level. The Senate District of Columbia Committee is looking into a health insurance program in the Capitol. Almost certain to come up at hearings is the question of drug prices.

Small Business Study

A study of interest to the CPI is opening in the Senate Small Business Committee. What's being characterized as the "dual distribution system" in the rubber tire industry will be scrutinized. Dealers have charged that rubber companies are selling directly to users below wholesale prices, thereby competing with franchised dealers.

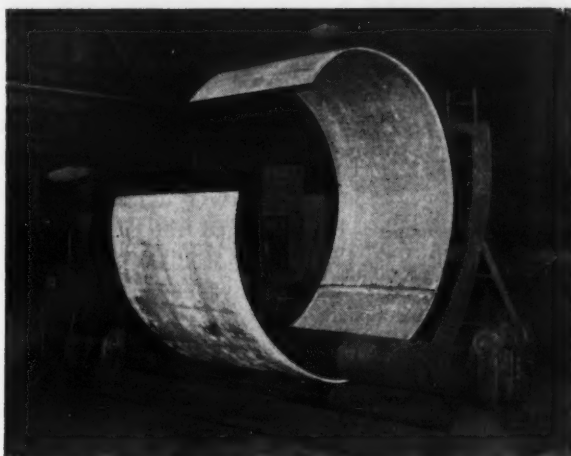
Back in the Congressional hopper for the third straight time are S. 11 and H. R. 11, introduced once again by Senator Kefauver and Rep. Wright Patman (D., Texas). These companion bills would remove a "good faith" meeting of a competitor's price as an absolute defense under the Robinson-Patman Act. Early indications are that this measure is gaining support.

Renewed efforts to strengthen anti-trust laws with a pre-merger notification requirement are promised in both houses. This measure would make it mandatory for companies to notify the government of intended mergers.

Corporate tax-cutting bill faces tough sledding

The Herlong-Baker Bill, which proposes gradual reductions in personal and corporate income taxes over a five-year period, will need all the business support it can get, and then it will still face

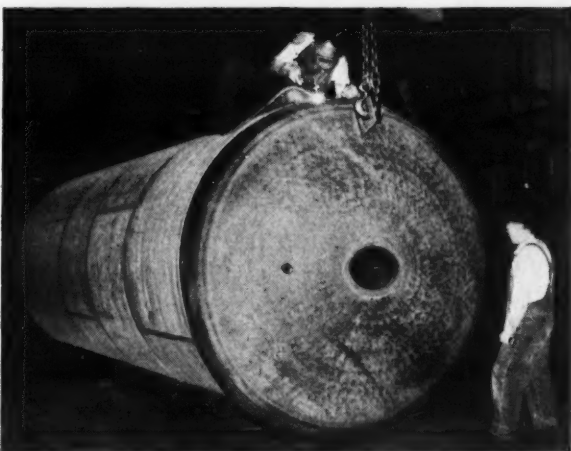
Tanks, heat exchangers and processing equipment for tough jobs are fabricated quickly and easily of corrosion-resistant Everdur®



At Old Dominion Iron and Steel Corporation, Belle Isle, Richmond, Virginia, (O.D.I.S.), fabricators of tanks, heat exchange equipment and pressure vessels, two plates of Everdur-1010 (151" x 56 1/16" x .513"), previously welded together, are rolled to form a cylindrical tank section.



When rolling is completed the beveled edges of the plates are butted to form a vee groove which then will be welded to complete the section. Five such sections will be put together by Old Dominion Iron & Steel Corporation to make the 26'-9" shell of the storage heater.



The storage heater is completed by attachment of two flanged and dished heads 96" outside diameter. The heads were press-formed and spun by Old Dominion Iron and Steel Corporation from circles of Everdur-1010, 104" in diameter and .674" thick.



The completed 10,000-gallon storage heater has 196 feet of welds. All welding was done with the inert-gas tungsten-arc using Everdur-1010 Welding Rod, which makes welds that meet ASME Boiler and Pressure Vessel Code requirements for soundness, strength, ductility.

EVERDUR-1010 provides the high strength and excellent corrosion resistance needed for all kinds of hot-water storage tanks and for pressure vessels and equipment used in the chemical and processing industries. This tank will be used for hot-water storage in a wool-dyeing plant.

High-strength, corrosion-resistant alloys, basically copper and silicon, are made and sold by The American Brass Company under its trade-mark, Everdur. They were developed for structural and engineering uses which require metals of high tensile strength combined with immunity to rusting, and corrosion resistance equivalent to that of copper. Everdur alloys are nonmagnetic, highly resistant to fatigue, and, depending on the alloy, suited to hot or cold working and economical fabrication by welding. 58107A

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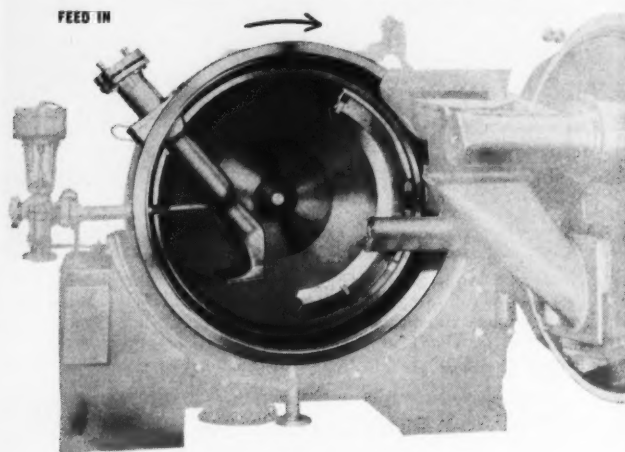
Made by The American Brass Company

Check 4053 opposite last page

SHARPLES C-41 SUPER-D-HYDRATOR

powered for peak demands...

LOAD—0 to 152.5 miles/hour



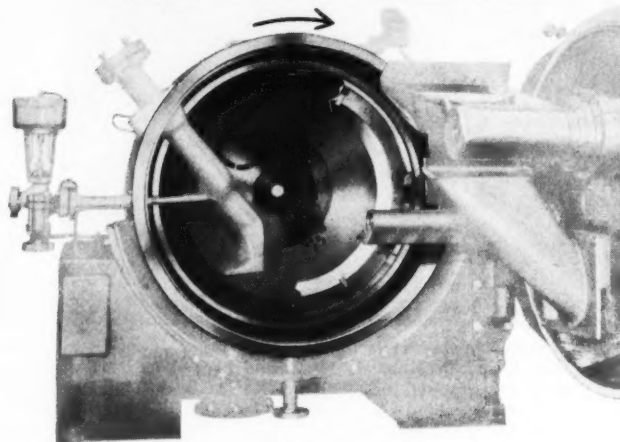
Sharples has designed the C-41 SUPER-D-HYDRATOR to utilize fully 150 or more horsepower because heretofore, insufficient power to load, accelerate and unload the crystals rapidly, has in many cases seriously limited crystal drying capacity.

With ample power available in the C-41, a thin cake of crystals is accelerated to rotation speeds up to 1250 rpm, and is subjected to centrifugal force of 900 x gravity—in a matter of 6 to 12 seconds.

At this high speed the thin layer of crystals quickly gives up its moisture—thus even slow draining crystals may be handled at high capacity.

The 300 to 400 lb. cake of dry crystals is deflected into the discharge chute by an hydraulically actuated knife—in less than one and one half seconds! There is no lost time for acceleration or deceleration. The SUPER-D-HYDRATOR automatically and instantaneously repeats the cycle as the centrifuge continually operates at full speed. Any part of the cycle may be adjusted while the centrifuge is in operation.

UNLOAD—in one and one half seconds



designed for both atmospheric and pressurized operation

It will pay you to look into the exceptional capabilities of the C-41 SUPER-D-HYDRATOR.

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Check 4054 opposite last page

WASHINGTON NEWS

a difficult time this session. Principal reason: Automatic tax cuts will total more than \$18.5 billion over the next five years, and officials here doubt there will be any major tax relief this year.

Features of the bill include corporate income tax reduction of one per cent a year for five years—from the present 52 per cent rate to 47 per cent plus reductions on business equipment and capital gains taxes.

Stronger law to speed tax write-offs pushed

If Rep. John Blatnik (D., Minn.) has his way, chemical processors and other manufacturers will get rapid tax write-off benefits for building new industrial waste treatment works.

Blatnik, author of the Federal Pollution Control Act of 1956, is pressing for legislation to strengthen the act. Besides the tax write-off provisions, the new law he would like to see passed would:

1. Double to \$100 million annually Federal grants for sharing cost of community waste disposal plants.
2. Raise individual community project grants to \$500,000 (double present grants).
3. Permit small communities to pool individual grants with neighboring communities for integrated waste disposal systems.

Ban on tax loss carry-over in mergers sought on Hill

Another tax legislation trend may be indicated by a bill introduced by Rep. Charles Vanik (D., Ohio) which would prevent tax loss carryovers in mergers. Under present law, a company can carry a tax loss back three years or forward five years. The Vanik bill would stop this and channel the money into the Federal treasury. Prospects of passage this session: Not too good.

New \$11 Million Urea Plant Set by SunOlin in Delaware

SunOlin Chemical Company is scheduled to begin construction this month of an \$11-million urea plant which will have a capacity of 73,000 tons a year. The Fauser-Montecatini process has been licensed to produce the urea.

Target date for beginning production has been set by year's end. Plant will be located on a 13½-acre site at North Claymont, Del., adjacent to Sun Oil Company's refinery at Marcus Hook, Pa.

M. W. Kellogg Company, New York, will design and build the plant together with steam methane reformer and auxiliary facilities. Nason & Cullen, Inc., Philadelphia, is contractor for construction of a \$77,000 office building now being erected on site. This building will serve as headquarters during plant construction and later will house operating staff of company.

The urea plant will be the fourth in the United States to use the Montecatini process. SunOlin, a joint subsidiary of Sun Oil Company and Olin Mathieson Chemical Corporation, was formed last fall.

American Chemical Corporation has started construction of a \$7.5-million petrochemical plant at Watson, Calif. Completion is scheduled for next January.

Major products will include ethyl chloride, ethylene dichloride, and vinyl chloride monomer. Also scheduled for production are plastic polymers and co-polymers, perchlorethylene, and trichlorethylene.

The plant is being built by C. F. Braun and Company, Los Angeles, on a site adjacent to Richfield Oil Corporation's refinery. Raw materials for petrochemical production will be supplied by Richfield and Stauffer Chemical Company, joint owners of American.

Du Pont has announced plans for construction of a plant to produce linear polyethylene by a low-pressure process, and expansion of existing facilities for manufacturing Mylar polyester film.

Construction of the low-pressure unit at the company's Sabine River Works at Orange, Texas, is expected to be completed by mid-1960. The product, to be known as Alathon linear polyethylene, will be made by a process developed under Du Pont's research program.

Manufacturing capacity for Mylar will be increased by 30% by expanding the company's Circleville, Ohio, plant. New facilities are scheduled to be ready for operation early in 1960.

Reichhold Chemicals (Canada) Limited has announced engineering work is being done for construction of two new plants in the Dominion.

One, a phenol plant and formaldehyde unit, will be built at the company's Port Moody, B. C., site. The other is a phthalic anhydride plant at St. Terese, Quebec.

Monsanto Chemical Company also is busy with expansion programs. It has completed a 25% increase of production capacity at Everett, Mass., for phthalate esters—the third major expansion of these facilities within five years.

At Nitro, W. Va., Monsanto has built a new plant for manufacture of Mersize. This is a chemically fortified pale rosin size used by paper manufacturers to give water resistance to paper and paper board. The plant is the second announced by the company within a month, the first being at Seattle, Wash.

U. S. Phosphoric Products Division, Tennessee Corporation, is building a plant at East Tampa, Fla., to produce a

modernize with **HydroElectric**

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- Braking with handle in any position
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"D-D" VALVES

When the diaphragm of a conventional diaphragm valve fails, there's leakage, loss, contamination, trouble. With the "D-D" valve this can't happen! If the diaphragm breaks, the disc still provides complete shut-off.

Consider this carefully where present diaphragm maintenance is so important in corrosive, abrasive, vacuum or other service.

"D-D" Valves are made in any metal or lined with glass, rubber or plastics. Manual or automatic operation. Bulletin 800 on request.



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6 YEAR PAYLOADER USER

"We didn't even consider buying anything else when we got this new Model HA"

Continental Fertilizer Co. supplies farmers in the vicinity of Nevada, Iowa with custom-mixed and ready-to-use fertilizers of various types. For more than six years this firm used a Model HA "PAYLOADER" tractor-shovel to unload box cars of raw materials and move these ingredients from various bins for dry blending and liquid fertilizer preparations.

They traded the old one for a new Model HA "PAYLOADER" (2,000-lb. carry capacity) last August. "Because of the exceptional, reliable performance we had had we didn't even consider buying anything else," says Oliver Haley, President and Manager. "Fertilizer dusts are tough on equipment, just like emery cloth. Yet our old HA was used 16 to 20 hours non-stop during the busy season and, in 6 years, we never had the head off the engine . . . never gave it anything but normal care for brakes, points and plugs."

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The same kind of performance and reliability is reported by chemical and fertilizer plants of every size on all sizes of "PAYLOADER" tractor-shovels from the model HA up to the big 4-wheel-drive 9,000-lb. carry capacity unit. There is a "PAYLOADER" model that can fit into your equipment plans too — that will help increase production and reduce bulk-material handling costs. Your nearby Hough Distributor is ready to give you the benefit of his extensive tractor-shovel knowledge and experience. Ask him about Hough Purchase and Lease Plans too.

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J-A-1

modified diammonium phosphate. It will be marketed under the trade name of Di-MoN. Plant, which has planned capacity of 100,000 tons a year, is expected to be on stream April 1.

National Starch Products Inc. expects to have expanded facilities at its vinyl acetate polymerization plant at Meredosia, Ill., in operation this month. The new addition, affording a 50% increase in capacity, was constructed by the Chemical Plants Division of Blaw-Knox Company.

Food Machinery and Chemical Corporation and **Allied Chemical Corporation** have announced a joint plan for production of carbon tetrachloride and carbon bisulfide. Production facilities, located at South Charleston, W. Va., will be operated by FMC. Plans call for expansion of plant capacity in near future.

Sun Oil Company has placed in operation at its Toledo, Ohio, refinery a \$150,000 sulfur recovery plant. Only 14' high, unit rests on a 10 x 30' base. Prefabricated in Dallas, Texas, by Tears Engineering, plant was skid-mounted and shipped on two rail flat cars. Plant can recover up to 12½ long tons per day.

Union Carbide Corporation announced it has exercised its option to purchase from Amoco Chemicals Corporation the utilizable facilities which remain on the 306-acre tract at Brownsville, Texas, site of a processing plant formerly operated by Amoco. Option also includes the 42-mile Weslaco-Brownsville natural gas pipeline.

Project was originally designed and built by Hydrocol, Inc. to produce synthetic gasoline, other petroleum fractions, and co-product chemicals from natural gas.

Morningstar-Paisley, Inc. announces production of liquid vinyl chloride and natural and synthetic latex compounds has started at its new plant at Clifton, N. J. Plant, which includes 100,000 sq ft of manufacturing space, adjoins company's recently acquired Haberland facility.

Check 4057 opposite last page

THAT'S INTERESTING

Drive-in volcano

Mt. Kilauea in the Hawaiian Islands is not only the world's lone drive-in volcano, it is also the most highly instrumented one.

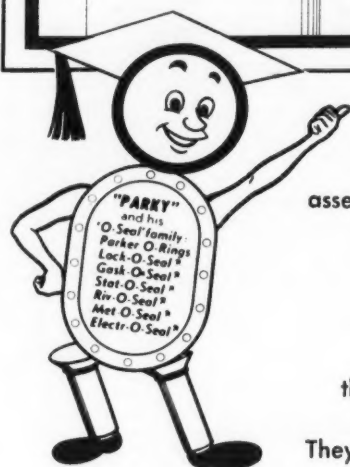
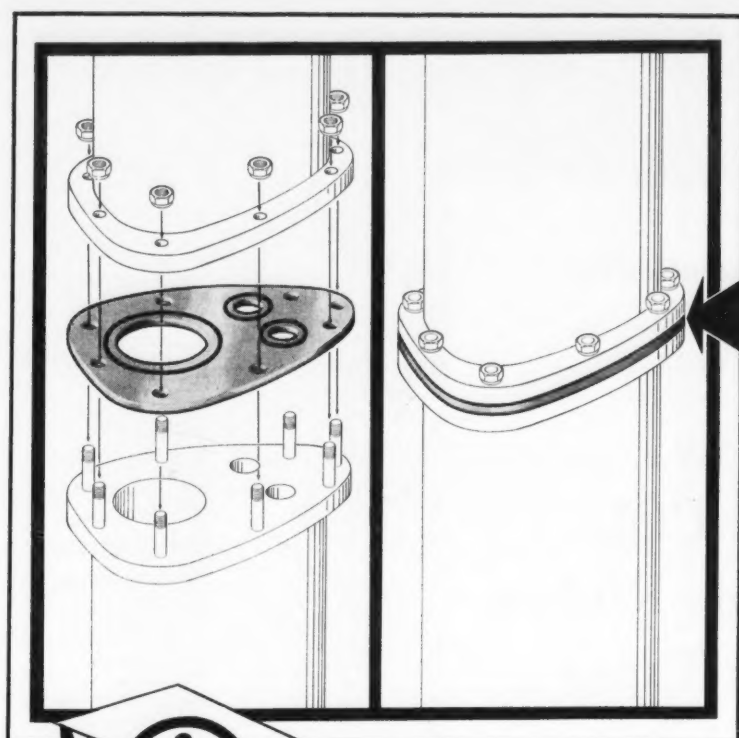
It's possible to drive your car next to the Halemaumau fire pit of Kilauea and look down into lava lakes boiling fiery orange 600 ft below. On a dramatic perch overlooking the fiery crater is the Hawaiian Volcano Observatory, operated by the U.S.

Geological Survey. Here, scientists probe for the secrets of the earth through a system of conduits that extends 25 or 30 miles inward.

Telephone diagnoses

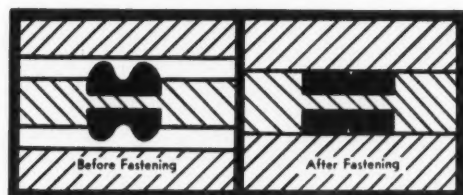
Five-pound transistorized unit which transmits heart sounds and electrocardiograph signals via phone should solve most problems of phone consultation between heart specialists.

(Industrial Research Newsletter, Armour Research Foundation of Illinois Institute of Technology)



Hundreds of accidents have been caused by seals being left out during assembly or repair, and thousands of production hours have also been lost for the same reason. Just one of the plus values of Gask-O-Seals is that they are practically impossible to leave out because they are inspectable visually after assembly. This can mean many valuable warranty dollars saved, many hours of downtime saved — and it may mean the saving of human lives.

They also provide no-leakage positive sealing, prevent blow-outs. Damaging coldflow is eliminated, high manufacturing and maintenance machining costs are avoided and they are reuseable. If you use static seals in your designs, why not find out about Gask-O-Seals — made by the makers of Parker O-rings.



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DO YOU KNOW ABOUT GASK-O-SEALS?

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Gask-O-Seal®
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Check 4058 opposite last page



nuclear notes

Significant news about atomic energy



Shape of atomic power to come

Located on a 44-acre site on the Somerset coast in Britain, the 500,000-kw Hinkley Point atomic power station is rapidly taking shape. Photo shows one of the two big reactors going up. Reactor building will be 180 ft high. Biological shield will reach 100 feet.

Private fuel processing predicted by 1965-70

Nuclear fuel processing may become a marginal business some time between 1965 and 1970, according to Dr. Charles H. Stockman, B. F. Goodrich Company, Brecksville, Ohio. Speaking at an annual AIChE meeting, he stated that the market for reactor fuel processing will not be sufficient to assure a fair return to private processors until that time. Private industry will stay out of the business until it is assured it can make a profit on the large plant investment required.

Reactor scoreboard — progress for 1958

The U.S. during 1958 completed 37 nuclear reactors in this country and abroad, according to a report issued by the Atomic Industrial Forum. Highlighting the units completed were engines for atomic submarines *Swordfish* and *Sargo*, a dual-reactor land-based prototype powerplant for a naval surface vessel, a single-reactor prototype for an

Glas-Col announces the Ultimate in Heating Tapes

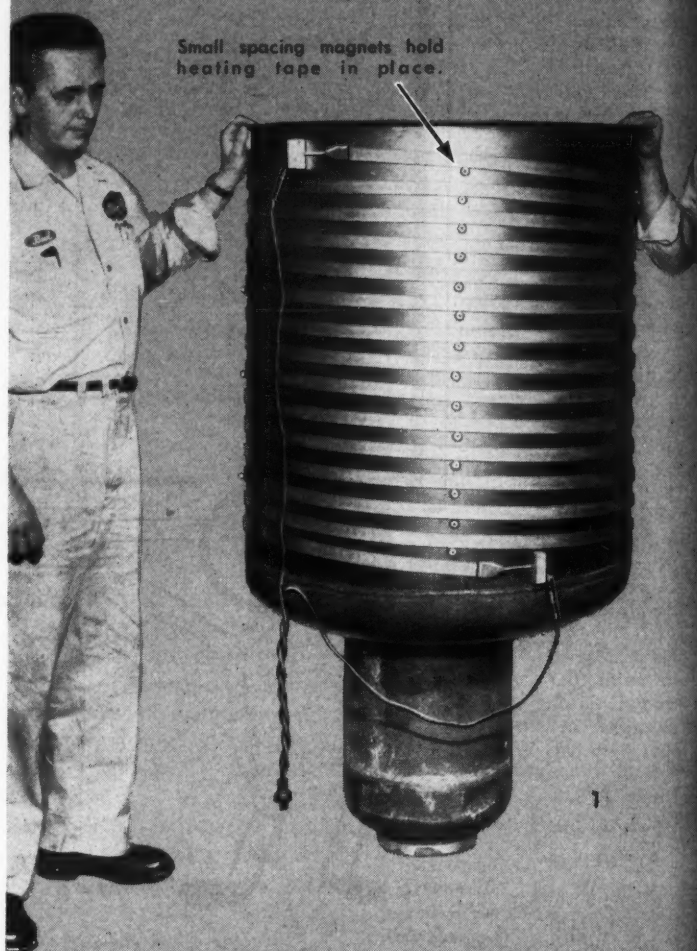
...the New GLAS-COL Nichrome Ribbon Heating Tapes

Patents Pending

*They won't burn out..
they're safe..
they're highly flexible*

How are the new Glas-Col Heating Tapes better?

The new Glas-Col heating tapes represent the most important design improvement in heating tapes within the last quarter century. Fragile, fine-wire, easily breakable heating elements that are woven into conventional tapes are a thing of the past. Instead, the heating element in the new Glas-Col tapes consists of a thin, but strong Nichrome ribbon. Covering is of glass braid, and silicone rubber . . . which is extremely tough and durable.



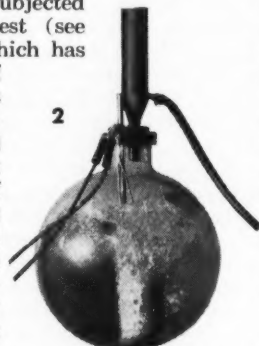
Just published! Ask for your copy of four-page Technical Bulletin 4-B which tells the complete story of Glas-Col Nichrome Ribbon Heating Tapes.

What are some of the advantages offered by Glas-Col heating tapes?

Glas-Col heating tapes will not burn out. They're tested at 1000 volts for electrical breakdown. They will give years of service if the silicone rubber covering is not subjected to temperatures above 480°F. The Nichrome heating element will not burn out even when used far beyond the assigned wattages.

They're available in long lengths . . . Glas-Col heating tapes are ideal for applications calling for extremely long lengths . . . many hundreds of feet. For the longer lengths you merely select a heating tape which is wider or thicker or both. Tapes 2" wide (or more) can be furnished. In spite of the long lengths, Glas-Col Nichrome Ribbon Heating Tapes furnish adequate watts per foot. For example, a Glas-Col 2" tape, 224 feet long, will give 16,900 watts at 440 volts, which is equivalent to 75 watts per foot.

They're waterproof . . . weatherproof. The presence of water or other fluids cannot cause burnouts. To definitely prove its waterproof characteristics, a 12-foot length of ½" wide Glas-Col heating tape was subjected to an extremely severe test (see picture #2). The tape, which has an arbitrary rating of 600 watts, 70 volts, was wrapped around a 3" diameter aluminum cylinder and used as an immersion heater for the boiling of water (in spite of the fact that it was not designed for use as an immersion heater). The water was re-fluxed continuously for four days in a 50-liter flask at an incredible power input of more than 5000 watts. Result: no burnout, no deterioration whatsoever.



2
Glas-Col heating tape is subjected to boiling water test for four days.

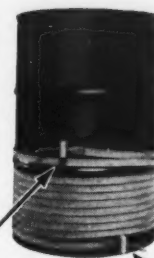
They're easy to install. For drums and similar steel tanks, the tape is simply wound around the area to be heated. Small, but powerful, permanent magnets hold each end of the tape (see picture #3). For applications where tape must be spaced, and must cover the full length of the receptacle, small spacing magnets are used, as shown in photo #1 on the adjoining page.

If the installation is to be permanent, or if the tank is quite large, the turns of the tape can be held in place by a simple spacing band (see picture #4).

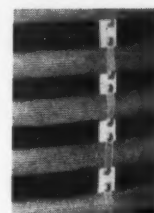
Glas-Col heating tapes are particularly suitable for heating pipelines. Costs of labor for installation are quite low. Tapes are merely strung lengthwise (one tape for small pipes . . . two tapes for diameters over 3"), then covered with insulation. Spiral wrapping, or the use of a large number of short tapes, (both of which would involve expensive labor) is not necessary.

They're safe. Glas-Col heating tapes have no exposure points where fine wires protrude from the tape.

They're flexible. Although the silicone rubber covering is rugged and tough, Glas-Col heating tapes are nevertheless extremely flexible and easy to handle. Total thickness is only 1/16".



3
Small, powerful, permanent magnets hold opposite ends of heating tapes.



4
Close-up view shows how simple spacing bands hold tape in place where installation is to be permanent.

advanced atomic submarine engine, and a ground-test experiment of a reactor designed for rocket propulsion.

Also completed were a small, transportable reactor designed for remote army bases, and two powerful test reactors. Remaining units included one small experiment and 27 relatively small research and training devices. The year 1958 also saw this country begin construction on 45 reactors in the U.S. and abroad.

(Information courtesy of Atomic Industrial Forum, Inc., 3 East 54th St., New York 22, New York.)

Metal foils offered for nuclear use

Thin metal foils for measuring radiation in various nuclear applications are available from the American Silver Company. Foils range in thickness from 0.010" down to 0.00005" in such metals as copper, beryllium, copper, gold, lead, nickel, palladium, platinum, tantalum, titanium, zinc, and stainless steel.

(Further information about foils may be obtained from the American Silver Company, 36-07 Prince St., Flushing 54, New York.)

Check 4060 opposite last page.

Study radiation's effect on "bottled" oxygen

Getting ready for the day of nuclear-powered aircraft, scientists at Battelle Memorial Institute are studying how nuclear radiation may affect the "bottled" oxygen supply of aircraft crews. The one-year project is sponsored by Air Research and Development Command to find out whether breathing oxygen may be stored outside a shielded area.

It is known that oxygen subjected to nuclear radiation can form ozone, and gaseous impurities in the oxygen may become radioactive. Whether "bottled" oxygen exposed to radiation will present a real health hazard is not known.

Glas-Col Apparatus Company, Dept. CP, 711 Hulman Street, Terre Haute, Indiana

U. S. Patents
2,282,078
2,739,220
2,231,506 and
2,739,221

GLAS-COL Heating Tapes



Glas-Col is the world's largest manufacturer of heating mantles . . . and produces a complete line for laboratory, pilot plant, and chemical process heating applications.

PRICES—Glas-Col Nichrome Ribbon Heating Tapes can be furnished in ANY LENGTH AT NO EXTRA COST. This table tells the story.

Glas-Col, under no circumstances, compromises with quality. A much cheaper tape could be produced . . . but it would not last.

Width	Cost per foot	Cost for finishing ends and fitting with plugs and heater cord	. . . OR if you desire standard lengths (completely finished with plugs and cords)	
¼"	\$0.80	\$7.00	\$11.80 (6 ft., 140 w., 35 v.)	\$15.00 (10 ft., 250 w., 60 v.)
½"	1.40	10.00	26.00 (12 ft., 600 w., 70 v.)	38.00 (20 ft., 930 w., 115 v.)
1"	2.75	10.00	90.00 (30 ft., 1650 w., 115 v.)	175.00 (60 ft., 3300 w., 220 v.)

(1" tape also available in 120 ft length: \$340.00)

Check 4059 opposite last page



WITH OR WITHOUT THIS PLATE all Niagara filters are built in strict accordance with ASME Code

The same ASME approved material and construction go into *every* Niagara filter. Welding of all Niagara filters is done by certified welders and all units, whether they are to be code stamped or not, are tested at *double* the normal operating pressure.

There is no "code equivalent" for ASME Code Standards at Niagara.

The only difference between a Niagara filter with and without the ASME plate is that it must be inspected and stamped by National Board inspectors before the plate is affixed.

The choice of having an ASME plate affixed is yours at nominal extra cost.

See Chemical Engineering Catalog for facts on Niagara Filters, or write us today, outlining your requirements.

Niagara® FILTERS
A DIVISION OF
American Machine and Metals, Inc.

Dept. CPN-359, EAST MOLINE, ILLINOIS
(Niagara Filters Europe: Kwakelpad 28, Alkmaar, Holland)

SPECIALISTS IN LIQUID-SOLIDS SEPARATION BY
PRESSURE-LEAF, PLATE and ROTARY VACUUM FILTRATIONS
and CENTRIFUGAL EXTRACTION

Check 4061 opposite last page

NUCLEAR NOTES

Radioisotope course at Oak Ridge

AEC is sponsoring another six week course in techniques of using radioisotopes in industry. The course is scheduled for April 6 to May 15, 1959 at Oak Ridge, Tennessee. It is similar to the one currently being held (February 9 to March 20).

(Additional information on the industrial radioisotope training course may be obtained by writing to Dr. Ralph T. Overman, Chairman, Special Training Division, Oak Ridge Institute of Nuclear Studies, P.O. Box 117, Oak Ridge, Tenn.)

H-Bomb's use in peace only matter of time

Project plowshare, the AEC's plan to experiment with atom weapons for peaceful uses, may have commercial applications in the very near future. While opposition to this may grow, it will not block eventual use of the weapons to move large masses of earth and rock, extract oil from low-grade shale deposits, and other peaceful objectives.

Statements were made by two University of Michigan researchers, Messrs. W. H. Berman and L. M. Hydeman, at recent industrial conference. They warned that unless adequate and prompt study is given to problems that may arise, the new peacetime uses of atomic explosions could lead into a "nightmare alley of administrative and legal confusion."

Nuclear power output — British 1970 goal

Great Britain hopes to have enough nuclear power stations operating by 1970 to produce at least half of her electricity requirements. Largest plant currently being planned will be located on Suffolk coast in East England. Having a capacity of 650,000 kw, the giant gas-cooled reactor will have 50,000 kw greater output than the stations the Russians have

announced in Siberia, and 150,000 kw more capacity than the largest British nuclear station now being built at Hinkley Point, Somerset.

Atom insurance issued for Dresden plant

A one million dollar nuclear liability insurance policy went into effect when the first nuclear fuel arrived at Commonwealth Edison Company's huge Dresden nuclear power station. Insurance coverage will be boosted, as additional fuel arrives, until it reaches sum of five million dollars. After reactor is loaded and put into operation, insurance coverage will again be raised to figure to be determined by AEC.

Reactor supervisor training program

AEC has established a training program at Shippingport Atomic Power Station for supervisory personnel of domestic and foreign organizations engaged in or planning the design, construction or operation of nuclear power plants. Twenty five participants can enroll every three months for the six-month course. First class started January 5, 1959. Tuition charge is \$2,000. Applications should be submitted direct to AEC.





recent books

reviews of current technical and reference work
... summarized for you by authorities in the
field with the CP staff

The Physical Chemistry of Electrolytic Solutions

Reviewed by
D. S. DAVIS
University of Alabama

In 836 pages, Harned and Owen have achieved an extensive revision in this third edition of their well-known treatise on the physical chemistry of electrolytic solutions. Significant additions are sections on irreversible processes, Mayer's cluster-sum theory, the conductance theory of Fuoss and Onsager, and the theory of conductivity of strong solutions developed by Onsager and Kim.

Book bristles with clear tables, excellent plots, sufficiently explained equations, and a good glossary of symbols. The thorough subject index is supplemented with an author index.

To obtain "The Physical Chemistry of Electrolytic Solutions" remit \$20.00 direct to Reinhold Publishing Corporation, 430 Park Avenue, New York 22, New York.

Spot Tests in Organic Analysis

Reviewed by
ALICIA J. PETRUSKA
Pensacola, Florida

This 600-page 5th edition of Prof. Fritz Feigl's standard work, while essentially similar to the previous edition, nevertheless has been brought up-to-date and enlarged by 110 additional tests. A convenient tabular summary of all tests has been retained. Ralph E. Oesper, PhD., again did the translation. The second chapter on methods and equipment by Prof. P. W. West is also repeated.

Both spot plate and filter-paper techniques are used

throughout this work. What Feigl calls "conditioning of tests" is defined in the very informative introduction in Chapter 1, and is demonstrated throughout by a discussion of chemistry involved in tests, giving limits of identification and dilution, and giving tests when certain interfering substances are present.

Tests for cations and anions, arranged according to classical qualitative schemes, are in Chapters 3 and 4, while Chapter 5 includes tests for free non-metals, metals, and alloys.

Chapter 6 gives outlines for separation of mixtures. An introduction to Weisz' fascinating chromatographic type "ring-oven method" for separation has been added.

Chapter 7, on applications to practical problems, has numerous additional tests covering various fields of interest.

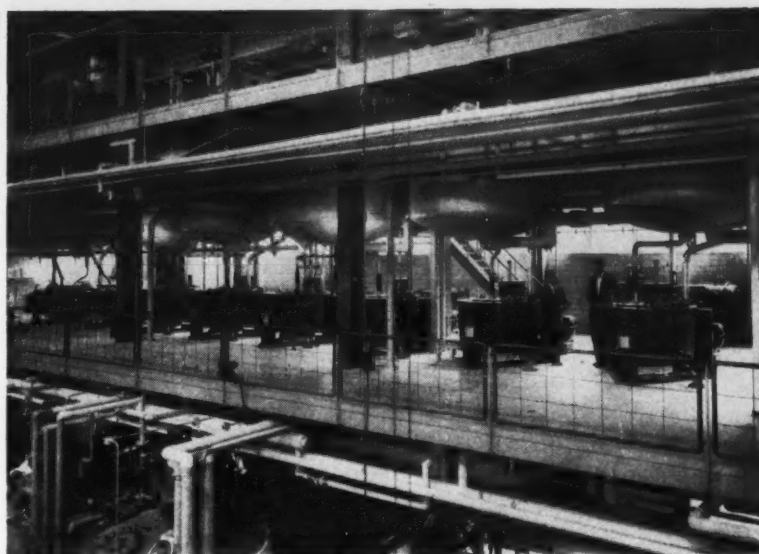
It is apparent that Feigl strives to be thorough in his description of procedures and to be complete in the range of fields he covers. The text is well-organized, and thus, should be a valuable reference for those whose work requires preliminary or decisive chemical qualitative tests.

To obtain "Spot Tests in Organic Analysis" remit \$13.25 direct to D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, New Jersey.

Check 4062 opposite last page.

Gas Chromatography

Proceedings and discussions of the International Symposium on Gas Chromatography held August 1957 at Michigan State University, under auspices of the Instrument Society of America, have been brought together in a 323-page volume. Editors were Vincent J. Coates, The Per-



Labor savings will pay for these 6 new BATCH-MASTERS® in less than 2 years

Nutley, N. J. — In expanding its production facilities for Gantrisin, one of their sulfa group pharmaceuticals, Hoffmann-LaRoche, Inc., had the option of selecting nine 48" conventional centrifugals or six 48" Tolhurst Batch-Master® machines.

After considering that only one man is required to tend each two "Batch-Masters," while four men are needed for every three conventional units, the manufacturer decided on the former machines. The resulting 75% labor savings will offset the total cost of the new machines in approximately 18 months.

The "Batch-Master's" fast bottom discharge and hydraulic unloading make the difference in labor requirements and in batch processing cycle time.

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Tolhurst® CENTRIFUGALS

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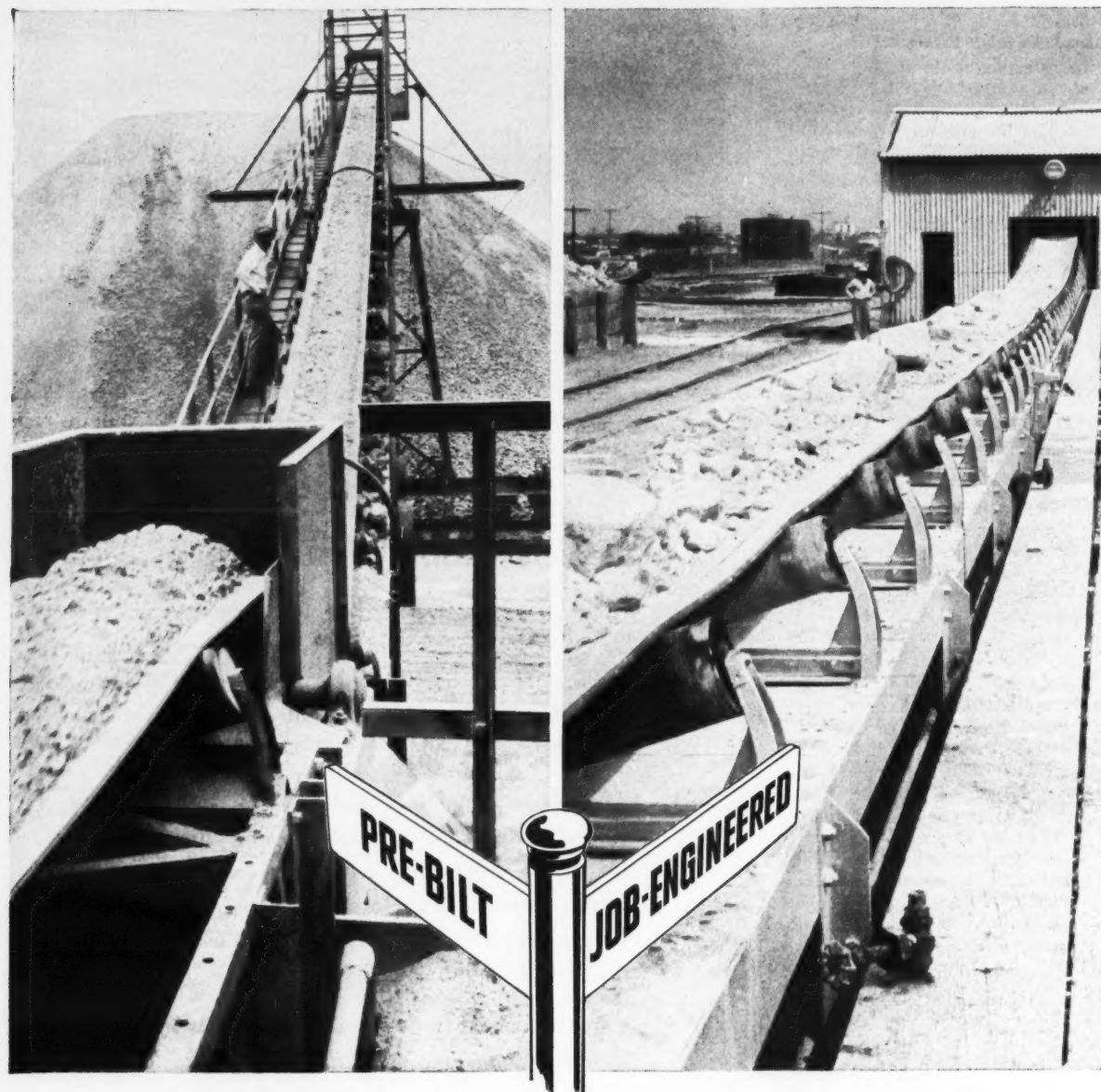
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Check 4063 opposite last page

Choose your route to lower handling costs



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LINK-BELT PRE-BILT SECTIONAL BELT CONVEYORS are pre-engineered . . . avoid need for detailed drawings. From standardized data, Link-Belt engineers prepare "on-the-site" quotations. Interchangeable, standardized parts speed selection, reduce purchasing costs.

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

LINK-BELT JOB-ENGINEERED BELT CONVEYORS. As a single source for design, equipment and erection of these systems, Link-Belt spares you coordination problems involving drawings and equipment . . . prevents waste of your engineering manhours.

For full details on both types of conveyors, contact your nearest Link-Belt office. Ask for 40-page Pre-Bilt Catalog 2779.

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RECENT BOOKS

kin-Elmer Corporation; Henry J. Noebels, Beckman Instruments, Inc., and Irving S. Fagerson, University of Massachusetts.

Includes 27-page bibliography on the subject, giving 442 references. This was prepared under direction of Stanley H. Langer and Charles Zahn of the U.S. Bureau of Mines.

To obtain "Gas Chromatography," remit \$10 to Academic Press Inc., 111 Fifth Avenue, New York 3, N.Y.

Check 4065 opposite last page.

Nuclear Engineering Handbook

The field of nuclear engineering is now represented in standard handbook form. Prepared by a group of 70 experts, the 1872-page volume covers in detail nuclear theory, nuclear engineering principles and techniques, reactor engineering, and many other phases of the field with thoroughness and authority.

All material is treated at a practical level for engineers interested in industrial and other uses of nuclear energy. Four major categories of information are covered: 1) basic data in nuclear engineering, 2) formulas and methods of calculations used in the design of reactors and other equipment, 3) discussions of the present state of the technology, and 4) reviews of nuclear theory and engineering principles.

Editor-in-chief is Harold Etherington, vice president of the Nuclear Energy Products Division of ACF Industries, Inc. The volume is divided into 14 sections, including a 149-page section on chemistry and chemical engineering. A 142-page section on radiation and radiological protection should be of vital interest to all engineers. The handbook is recommended as a "must" for every technical bookshelf.

To obtain "Nuclear Engineering Handbook," remit \$25.00 direct to McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N.Y.

Check 4064 opposite last page

CHEMICAL PROCESSING

THAT'S INTERESTING

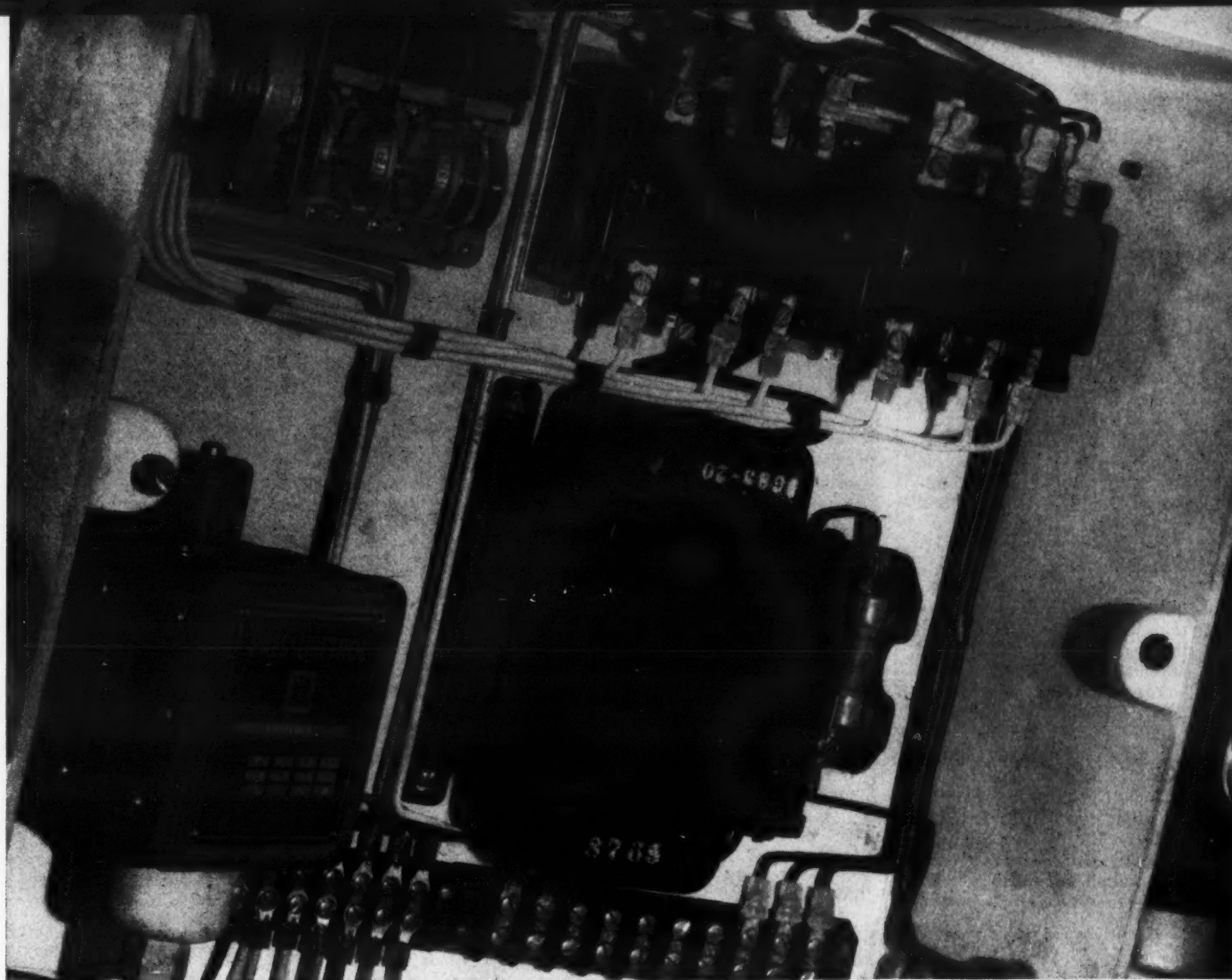
Russian progress

USSR is reported to have prepared designs for two gas-turbine type locomotives, one of 6500 hp and one of 7500 hp. Both locomotives would be two-unit six-axle types. The Soviets are also studying designs for the use of free-piston engines.

See what develops

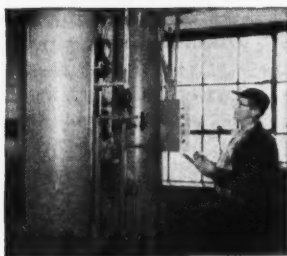
New photographic film does things once thought impossible. You can develop it in broad daylight — takes only 2 or 3 minutes. All you need is hot water. New film permits you to transfer color film into black and white negatives from which prints and enlargement can be made. Slides for projection can also be made from ordinary negatives. (Feature, Central News, Inc.)

For more information on product at right, specify 4066 see information request blank opposite last page.



For "set it and forget it" gas drying—

Come to Kemp



Kemp Dryer protects instrument lines at -25° for Quaker State's Farmer's Valley, Pa. plant. Fully automatic operation saves time and manpower, yet provides dependable service on a 24 hour basis.

Here's the nerve center of every Kemp Fully Automatic Gas Drying Unit. Drying process gasses and inerts . . . air for pneumatic instruments and tools . . . liquids . . . for pressurizing anhydrous liquids . . . this panel controls the Kemp Dryer surely and safely. Once timed to meet your program, it provides efficient drying on a continuous basis, without worry or excessive maintenance.

Note the precision with which even the wiring is connected. It's typical of the thorough workmanship going into every component of the Kemp Dryer. Kemp Dryers are built with care; built to last and perform year after year with dependability resulting from a quarter century's experience.

Whether your operation calls for a completely automatic Kemp Dryer, a semi-automatic model, or a simple, manually operated unit, there's a model and capacity to meet your needs. Kemp Field Engineers will gladly study your problem and make complete recommendations, even down to the proper desiccant (we select from over 20) to do your job best.



Call in your Kemp Representative when you plan a new installation or wish to up-date an old one. He'll give you full information. Or write direct and ask for Bulletin D-102: THE C. M. KEMP MFG. CO., 405 E. Oliver Street, Baltimore 2, Maryland.



Convection
Dryers



Inert Gas
Generators



Nitrogen
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Orlad
Dryers

Transactions

Automation and Computers

Presented as part of the University of Texas' 75th anniversary, Transactions and Conference on Automation and Computers was held as a short course on many of today's advanced uses of computers. Just a short list of many of the papers presented suggest the scope: Computers in Process Research — E. A. McCracken; What is Automatic Programming? — Dr. B. M. Wolontis; Use of Computers as a Research Tool — R. W. DeSio; plus others.

Besides including basic information needed to understand and use automatic digital computers, the Transactions should be useful to all those already in the field of automatic control plus those whose interests lie in the fringe areas of this rapidly expanding field. Consisting of 321 pages, the two volumes also include discussions on the financial justification for automation, flow and storage of material in a manufacturing company, and frontiers of computer application.

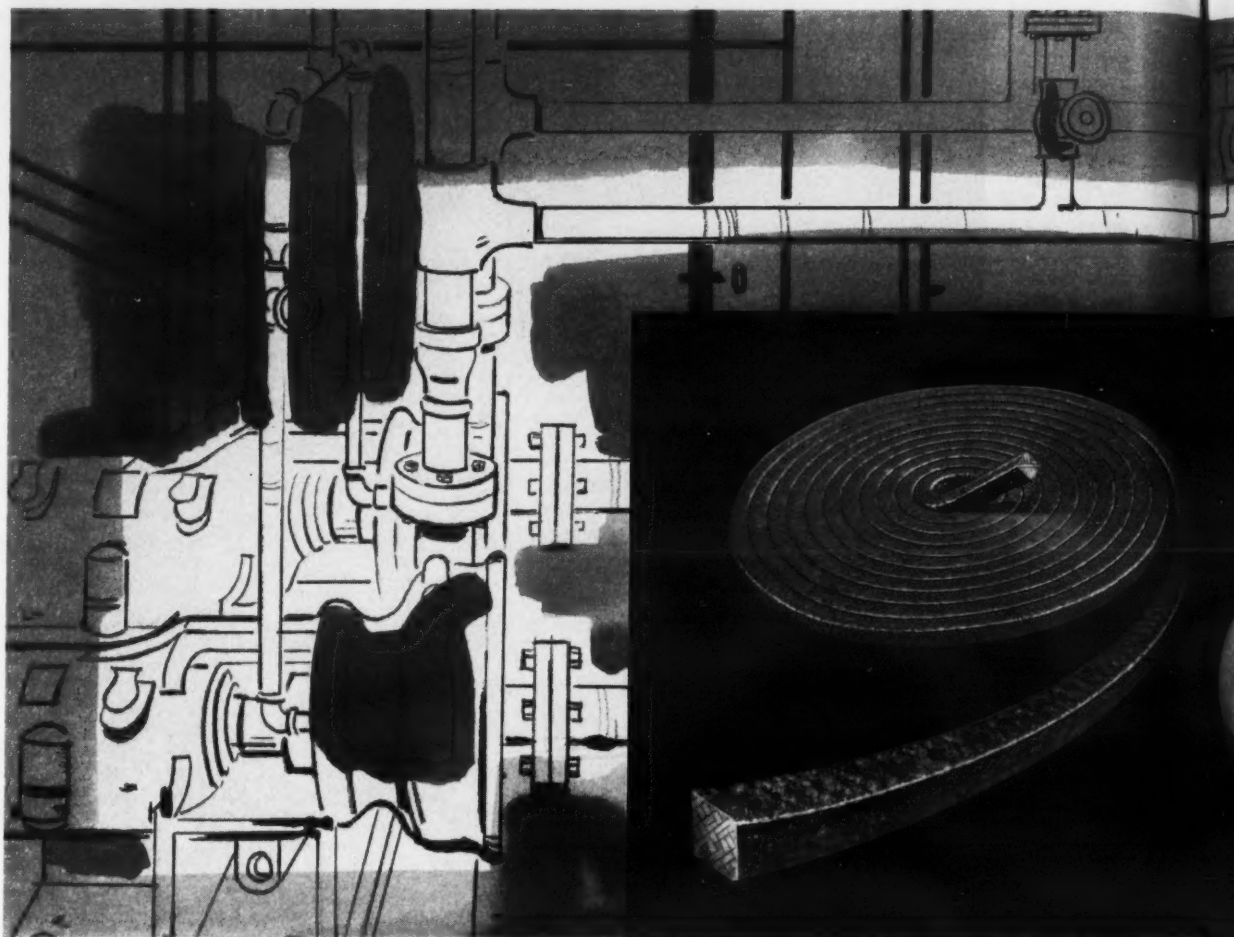
To obtain "Transactions — Automation and Computers," Vol. I and II, remit \$15 direct to B. H. Amstead, U. of Texas, Engineering Bldg. 114, Austin 12, Texas.

Analytical Uses of Ethylenediamine-tetraacetic Acid

Reviewed by
Dr. E. L. Grove
University of Alabama

"The Analytical Uses of Ethylenediaminetetraacetic Acid" is an excellent reference for anyone interested in the field of complexing agents or who has a specific analytical problem. The author, Dr. F. J. Welcher of Indiana University, has collected the significant material from most of the approximately 950 papers published before 1957 and has compiled this material into a single 366-page volume that

What Garlock Salesmen tell



"LATTICE-BRAID* TEFLON† PACKING IS YOUR BEST BET FOR PUMPS AND ENGINES"

"LATTICE-BRAID TEFLON is just about perfect against chemicals—it's a strong, long-lasting, chemically-inert packing that reduces maintenance and downtime. Let me show you what I mean.

"With LATTICE-BRAID packing, each strand passes diagonally through the body of the packing at a 45° angle. This through-and-through braiding makes a completely unified structure of *greater strength*. Ordinary braided packings become worthless once the single outer cover is worn through. On LATTICE-BRAID, there is no single outer cover; thus, the braiding holds together far beyond the limits of other packings. This, obviously, results in *longer life*.

"On top of this, you have the advantage of TEFLON. It is completely unaffected by the strongest acids, solvents, and alkalis. Co-efficient of friction is extremely low, and it will withstand temperatures ranging from -90° F to +500° F.

"One customer repacked every two weeks on a solvent recovery pump application. He changed to LATTICE-BRAID TEFLON over two years ago and hasn't repacked since."

Garlock can furnish you with LATTICE-BRAID packing in a variety of sizes and styles depending on what you need. If you have a particular problem, call our sales office in your area. Or, you can write for further information. Ask for Catalog AD-131.

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†DuPont Trademark

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Packings, Gaskets, Oil Seals, Mechanical Seals,
Molded and Extruded Rubber, Plastic Products

Chemical Processing Customers

RECENT BOOKS

simplifies study of the subject.

First chapter is a concise discussion of the chemistry of EDTA. It includes such topics as structure, effect of pH upon complex formation, and formation constants. Second chapter discusses end-point detection briefly under topics such as metal indicators, direct titration with EDTA, and potentiometric methods. Elements are covered that have been determined by each method as well as by some general procedures.

Two chapters are devoted to metal indicators and use of masking agents and other means for separation or elimination of interfering materials. Remaining chapters are devoted to specific analyses, either under the heading of the elements involved or a special topic such as water hardness.

In general, a condensed procedure is given for each element, with brief discussion or summary of the reference. No attempt is made to evaluate each method, although some are indicated to have limited use because of disadvantages.

To obtain "The Analytical Uses of Ethylenediaminetetraacetic Acid" remit \$8.50 direct to D. Van Nostrand Co., Inc., 120 Alexander Street, Princeton, New Jersey.

Check 4068 opposite last page.

"BUY LONG-LASTING TEFLON GASKETS FOR PIPING, FLANGES AND FITTINGS"

"With TEFLON jacketed gaskets the outstanding advantage is that you get the fine qualities of TEFLON without sacrificing resiliency and deformability. This, of course, is extremely important on your glass-lined steel piping and process equipment, light metal flanges, and glass pipe flanges and fittings.

"The first step in choosing the proper gasket is to select the type which will work best for you. TEFLON-jacketed gaskets come in four basic designs:

"Once this design is chosen, it's a matter of considering the filler material and thickness. For example, for high pressures, a corrugated stainless steel filler is suggested. Where the application is for glass-lined steel connections with low bolt loads, a rubber filler should be sandwiched between woven asbestos cloth. We offer many different types of fillers, depending on what you need—rubber, asbestos, cork, etc."

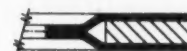
Why not let our representative in your area help you select the right gasket design? Discuss your problem with him or write for our Catalog AD-154.



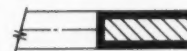
THE GARLOCK PACKING COMPANY, Palmyra, N. Y. For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U. S. and Canada.

CANADIAN DIVISION: The Garlock Packing Company of Canada Limited
PLASTICS DIVISION: United States Gasket Company

Check 4067 opposite last page



A: Slit Envelope. Teflon stock slit from outside diameter to within $\frac{1}{8}$ " of inside diameter.



B: Milled Envelope. Teflon stock machined from outside diameter to within $\frac{1}{8}$ " of inside diameter. Gasket I.D. does not interfere with process flow.



C: Formed Shield for large diameters and irregular opening such as elliptical manholes.



D: Double Jacket. Two jackets overlapping to protect O.D. as well as I.D. For glass-lined steel nozzles.



"It's a book on the diplomatic handling of men, yuh nosy jerk."



In this revolving drum, tablets are coated with syrups, powders and waxes. Because the drum is Stainless Steel, it takes only a few seconds to clean it with steam jets.

Stainless Steel equipment protects 100% product purity

at Eli Lilly and Company, Indianapolis, Indiana

"Science has created hundreds of lifesaving and pain-relieving formulas," says an official of Eli Lilly and Company. "But unless these formulas are produced in medicines that are 100% free of every possible contamination, they could do more harm than good. We make millions of tablets every month, for instance, and we must be positive that the ingredients are pure for every single one. That's why we use nothing but Stainless Steel for so much of our equipment.

"Stainless guarantees product purity. It resists corrosion. It's durable and hard, won't chip or crack. It has a smooth, dense surface that is easy to keep clean—and it is not harmed by the cleaning agents we must use. True, we paid more to install Stainless Steel, but it will save money in the long run because we don't have to worry about replacements."

Eliminate product contamination in your plant. Start by examining your equipment to see if it's a threat to cleanliness. Replace it with Stainless Steel. And specify USS Stainless Steel for service-tested quality.

USS Stainless Steel is available through your U.S. Steel representative or your local Steel Service Center.

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United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
National Tube—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company



United States Steel

Nurturing new-product ideas is recognized as vital to the continuing success of Ansul Chemical Company. Top management has looked for ways to make product planning everybody's business because it believes that . . .

'People Support What They Help Create'

ROBERT C. HOOD, President
Ansul Chemical Company



ROBERT C. HOOD, president since 1949 of Ansul Chemical Company, Marinette, Wis., is one of industry's effective spokesmen for advances in management theory and practice. He is well known throughout the United States and Europe for his company's experience with participative management, a method aimed at "unleashing the full creative potential of people."

Hood has led industrial training seminars in Austria and Italy, and has visited many European countries, including Russia, to study their organization practices.

In education and research, Ansul's young president — he's 41 — has collaborated with social scientists from Michigan, Massachusetts Institute of Technology, Yale, Texas, California Institute of Technology, and others.

Ansul Chemical Company once felt like a mother sea turtle. You all know how this marine reptile literally weeps at spawning time because she knows by instinct that only one or two of her progeny will ever reach maturity.

Until three years ago, Ansul figuratively shed tears over the high mortality rate of new-product ideas hatched within the organization. Ansul's management team constantly sought the answers to "How do you find new products — develop them quickly — produce them economically — sell them successfully?"

The answers began to come when the team sat down and applied basic management concepts which have guided other phases of company operation:

1. Ansul management sincerely believes that "People Support What They Help Create." If representatives from all phases of company operation (manufacturing, financing, promotion and selling, as well as research and development) were included in planning a new product, they would have an emotional stake in its success.

Difficulties in development could be foreseen and prevented. Ansul's management has come to feel that employee apathy can play a tremendous part in a new product's failure — much greater than is generally realized.

Many Skills Needed

2. Ansul is a small company and, with a total of 485 employees, cannot afford the investment in personnel and skills required for a separate division to work on new products exclusively. At the same time, many varied skills are required to shepherd a new-product idea through the development stages and into the market.

The best answer seemed to be to utilize in the new product area the skills that existed within the company in its operating departments. These people with their thorough knowledge of the day-to-day operations of the company could bring their skills to bear on a new product project . . . but equally important, they were the ones who would in any event become responsible for the product as it emerged from development and attempted to take its place as a standard company product.

3. Thus Ansul assigned its people two jobs: one to work on their key day-to-day operating assignments; the other to work in the area of product development.

In the first area Ansul people work in a vertical organization — a hierarchy where superiors and subordinates operate in the normal organizational manner to execute work, to "get things done."

In the second area, that of product development, Ansul has shattered the traditional hierarchy by grouping people in a horizontal organization, where the goal is creativity, ideas, the bringing together of varied skills and experiences.

In these horizontal — or "flexible" groups as they are referred to — there is no line of authority. No man works in a flexible group with his immediate superiors or subordinates. He works with peers . . . and this seems to improve the free flow of ideas.

Coordination Necessary

4. The lack of a hierarchy in these product planning groups does not eliminate the need for coordination. This function is performed by William R. Rinelli, whose job it is to see that projects are kept on schedule and to act as liaison between various operations.

Rinelli is a man with 20 years' sales, marketing, and technical experience in the company. He reports directly to the president. One of Rinelli's basic functions is stimulation of new-product ideas from within the company.

He tries to make each employee feel that his ideas are needed and appreciated with a thorough and impartial screening system. Every idea is described on paper,

sketched, and circulated to a preliminary screening committee. At that point the decision is made on whether to recommend it to the Product Planning Policy Committee.

PPPC represents top management in product planning. Its members include all area heads. They set broad compa-

group of nitrogen heterocyclics and formulate an integrated step-wise program for research, development, and marketing which would best exploit short- and long-range opportunities.

PIT 19 was one of the few which have been assigned to formulate the work program

set up the final work program for nitrogen heterocyclics and prepared to assume the role of product producers, pyrrolidine was high on the list of chemicals recommended for short-range development. It was used as a pharmaceutical intermediate in quantities large enough to make manufacture profitable, and there was no domestic competition.

PPPC decided that preliminary findings of PIT 19 warranted formation of PIT 26, which was to accumulate data, evaluate, and recommend a step-wise program to manufacture and sell pyrrolidine.

Members of PIT 26 included managers of market research and development department, chemical sales department, pilot plant engineer, and one representative each from chemical production, analysis laboratory, and chemical research.

They were to determine potential end-uses of pyrrolidine, total market per year and projected five years (with Ansul's share in both cases), the manufacturing costs, and the selling price.

Market Chief on Road

While members of PIT 26 met periodically, the manager of market research, with a background of work in the nitrogen heterocyclic field, took to the road to get first-hand interviews with prospective customers. He found several companies which made

tentative commitments depending on whether Ansul pyrrolidine would meet their standards of purity.

Meanwhile, chemical researchers and the pilot plant engineer were working out a process which would produce pyrrolidine of at least 95% purity at a price competitive with the foreign market. A number of catalysts were tried, and many fractionation experiments were made.

Work between the research lab and pilot plant finally resulted in pilot plant manufacture of pyrrolidine which met or exceeded minimum standards of purity. Market research announced in trade magazines that pyrrolidine was available in sample quantities. Nearly 100 inquiries were received.

Get Substantial Order

Contacts made by market research finally resulted in a substantial order, dependent upon whether Ansul could provide pyrrolidine of at least 95% purity. This was made again in the pilot plant, and analysis indicated it was between 97 and 98% purity. However, the customer's analysis indicated purity was below the critical point.

Several letters were exchanged with the customer's analysis laboratory before PIT 26 met to consider these problems. Letters confirmed PIT members' belief that

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Members of Ansul Chemical Company's PIT 26 discuss a Gantt chart on development of pyrrolidine, a new product. Left to right are William Peters, analytical chemist; Gilbert Johnson, chemical project engineer; Robert Gottschalk, pilot plant engineer; Morris Neuville (standing), manager of Market Research and Development and recorder-convenor of the PIT; Frank Wedge, manager of Chemical Sales, and Robert Zellner, senior research chemist

ny policies, investigate and review products, and decide whether these products will be manufactured. The group also schedules work and assigns responsibility for work on actual projects.

One of the most recent products to come out of the planning system is Ansul pyrrolidine, which was recently turned over to the company's sales operation as a standard product.

Investigation Team Formed

Pyrrolidine came from an idea several years ago that the nitrogen heterocyclic field looked promising for Ansul's future expansion. Top management acquired several process patents in this area, and PPPC authorized Rinelli to form Product Investigation Team 19 to study the whole

for a new chemical field. Most PITs, the heart of Ansul's product evaluation program, are fact-finding bodies of men who can supply detailed knowledge and skills required to determine whether a specific product can be manufactured and sold at a profit.

PITs could be called the logical result of a belief which is the basis of Ansul's management philosophy: "People support what they help create."

PPPC is made up of area heads who are responsible for seeing that jobs they authorize are carried through.

PITs are made up of active staff members of area heads, who, in most cases, will carry out the detailed research and development necessary to produce a product they have recommended.

When members of PIT 19



Technician Bob Stewart (left) and Bob Gottschalk, pilot plant engineer, check reactor instrument panel as they make a pilot plant run on pyrrolidine at Ansul's plant at Marinette, Wis.



The founder of the labor movement in this country, Samuel Gompers, said that no lasting gain will come from compulsion. With 19 states already having right-to-work statutes — including industrial Indiana and Texas, the petrochemical center of the world — and more states having tests coming up, now is the time . . .



WE SHOULD FIGHT FOR THE RIGHT TO WORK

FRED ALLAN HARTLEY JR.



Fred Allan Hartley, Jr. is co-author of the Taft-Hartley law. Elected to Congress in 1928 from the state of New Jersey, Mr. Hartley was a member of the Committee on Education and Labor for 20 consecutive years until his voluntary retirement in 1949. He went out under his own steam!

At present he is co-chairman of the Conference of American Small Business Organizations and chairman of the Advisory Board of the National Right-to-Work Committee.

IN the old days some companies required that a new employee sign a contract saying he would not join a union while employed at the company. Labor called this a "yellow dog" contract. In 1933 this type of contract was outlawed with the Norris-LaGuardia act. I voted for its passage.

Labor has now reversed itself by setting up the requirement that before you can get a job in a unionized plant, you must sign a contract saying that you will join the union — and in addition will pay dues and sometimes an initiation fee. If this isn't a "yellow dog" contract, it certainly is "an ol' houn' dog" contract.

Compulsory unionism through the closed shop or the union shop is morally wrong. Labor leaders are betraying the philosophy of the founder of the labor movement in this country, Samuel Gompers, in insisting on forced union membership. Mr. Gompers' words are even more applicable now than when they were said, a time when labor was not nearly as strong financially, numerically, and politically as today. Here is

what Mr. Gompers said:

"Guided by voluntary principles, our organization has grown from a weakling into the best organized labor movement in all the world. I urge devotion to the principles of voluntarism. No lasting gain has ever come from compulsion. If we seek to force, we but tear apart; that which is united is invincible."

Right-to-work laws — now in force in 19 states — do not interfere with a man's right to join a union. In fact, they protect that right. However, they equally protect his right to stay out of a union. It is not generally known that over twice as many manual workers in the country have not seen fit to join a union as are in the AFL-CIO.

Protects Chemical Plant

In addition to protecting workers, right-to-work laws can protect a plant. An example of this is the recent experience of a large chemical plant in a state having a right-to-work law.

A picket line was being maintained around this plant

to try to force recognition of the union although the union had just been turned down in an election by four to one. The fact that the state had a right-to-work law enabled the company to get an injunction and stop the illegal picket line.

Labor has tried to belittle the right-to-work movement by saying that none of the 19 states having right-to-work laws has much industry. Texas — the petrochemical center of the world — has a right-to-work law. Indiana and North Carolina have such laws. They are certainly not non-industrial. Kansas, which just passed a right-to-work law, has many large industries such as the aircraft industry.

The reason more states did not adopt right-to-work laws last November is that the issues were not clearly understood and industrial leaders did not fight for the passage of these laws as they should have. However, no state repealed a right-to-work law and one more state was gained in the last election. Delaware and other states have tests coming up.

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Are you attuned to the "Toxicological Age"?
Do you keep toxicological data from others to the
possible detriment of science? Maybe it's
time to shift gears in your thinking. Here
are some reasons why . . .

Joint Research Is Best Bet for Toxicological Studies

LAWRENCE A. COLEMAN
General Counsel
Allied Chemical Corporation



Lawrence A. Coleman is general counsel of Allied Chemical Corporation, a position to which he was appointed on February 26, 1957. He joined Allied's legal staff in 1941, spent five years in the Army and resumed with Allied in 1946. He holds an AB (in chemistry) from Cornell University; LLB from Columbia University Law School, and a Doctor of Juridical Science from St. Lawrence University (Brooklyn Law School).

He is a member of the American Chemical Society, the American Bar Association, is chairman of the Manufacturing Chemists' Association food additive committee, and a member of the legal committee of the Industrial Hygiene Foundation.

JOINT RESEARCH efforts and free exchange of information in gathering data for purposes of describing a toxicity hazard on a label should be the aim of business, rather than the lone wolf approach which is an ineffective attack upon the problem.

Although it is commonplace to observe that we are living in the Atomic Age, it would seem that ours is a time which may also come to be known as the "Toxicological Age." And it is easy to see why, for it is upon toxicity and the hazards engendered by that toxicity (among other criteria) that labeling requirements for chemical substances will depend.

It follows, then, that businessmen dealing in chemical substances must acquire a fairly good knowledge of their toxicity and potential hazard in order to draw up labels, and toxicological studies will have become, more than ever, an element of doing business.

Toxicological Age

The science of toxicology has come to stand astride a large sector of American industry. It has become an essential, integral consideration of doing business. It can be said to have made the Toxicological Age.

Response of businessmen to this challenge has not been a uniform or consistent one. It is at present principally an individual one, determined in each

instance by unique business considerations.

Many concerns believe that acquired toxicological data may be freely and candidly disclosed to competitors. Others regard the data as instruments of competitive advantage. As a consequence, the American consuming public, whose interest in the results of toxicological research is the really paramount one, is sometimes denied the full benefit of what is known.

Five Advantages

Advantages of joint research effort over the lone wolf approach are several:

1. Research conducted by a single company can be extremely expensive; indeed, expense may prevent the decision to undertake research despite a clear need for data. Then the public may be done a disservice by withholding of a product.

2. Research undertaken by competing companies on the same product may wastefully duplicate data. On the other hand, if differing programs are initiated, contradictory data may result. Thus neither company, if made aware of data of the other by common customers, is secure in the knowledge that its decision to market or withhold a product is a sound one.

3. Individual research cannot hope to achieve the sum of the collective intelligence of scientists jointly engaged on the same research program.

4. Opportunity for establishment of reasonably uniform research standards is lost in divided effort. Consequent-

ly, the authority of an individual conclusion is weakened by its very individuality.

5. Individual research seems to miss the point that proper labeling of a product is a problem facing all industry and demands a collective response. Certainly, from a competitive free-enterprise point of view, little is gained by a divided response.

It seems clear, then, that industry's response to the Toxicological Age should involve, in appropriate cases, joint research efforts and free exchange of information.

At the same time I am aware that this proposal is not without its difficulties. Some companies may be troubled by the possible application of the anti-trust laws to joint research; nor in the light of cases and interpretations is this troubled feeling unrealistic.

My own view is that a joint research effort, the conclusions of which are made freely available to the world at large, cannot result in unreasonable restraints of trade within the contemplation of the Sherman Act. However, I would not hesitate to obtain the express approval of federal authorities to any program of joint research, even though designed purely to protect or improve the public health.

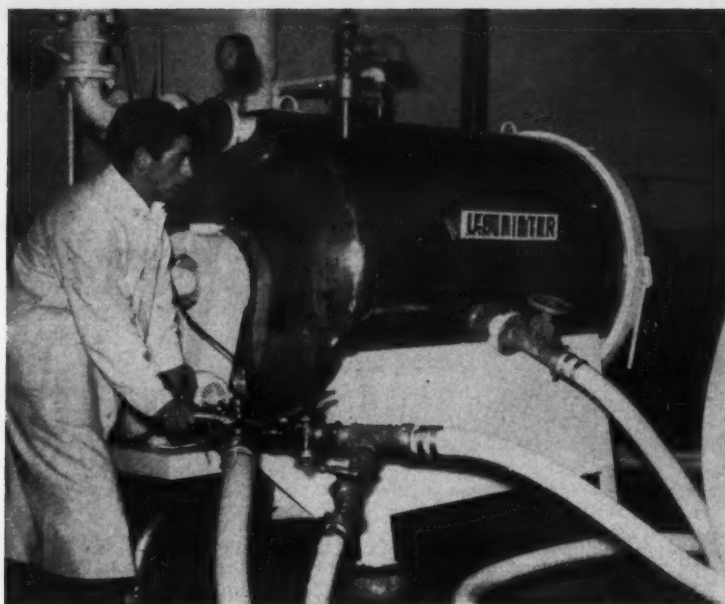
It is my considered opinion that the accelerated rate at which demands are being made of industry for toxicity data and the great expense which these data entail indicate that reorganization of our research methods in this field will soon be a compelling need.

Condensation of a talk given recently before the Industrial Hygiene Foundation in Pittsburgh, Pa.



Automatic, jet-washing, pressure-
leaf filter in operation at
Buckeye Brewing

Marking the first installation of this
automatic, jet-washing filter in the brewery
industry, stainless steel, pressure-leaf
unit that helps to maintain high quality of
product —



Photos by CP Staff

Lowers filter washing time from 1½ hr to 4-5 min

GORDON WEYERMULLER, Associate Editor
with **A. J. BRAUN**, Vice Pres. in Chg. of Production
Buckeye Brewing Company, Toledo, Ohio

Problem: Filter formerly
used for first-stage filtration
of beer at Buckeye Brewing
Co. took about 1½ hr to clean
and place back in operation.
Filter, a vertical, cylindrical
type, had to be opened up and
leaves sluiced manually with
a water hose.

Since this was done twice
during normal two-shift op-

eration, this meant three hr
lost production time every
day — a very expensive pro-
cedure.

In production of beer, first
step is brewing, then fermenta-
tion. Next beer goes to Ruh
storage. After storage, beer
passes to first-stage filtration
or prefiltration. This is the
step in which the previous fil-

ter was used. After prefiltra-
tion, beer goes to another
storage, then is given a final
polish filtration.

Solution: In Sept. 1957
Buckeye placed an Auto-Jet
filter in operation for the pre-
filtration step. This horizontal,
pressure-leaf unit has spe-
cially designed jets that per-
mit rapid, automatic cleaning.

Each jet has a split spray
that shoots liquid at a pres-
sure of 50-60 psi against two
screen surfaces simultaneous-
ly. This keeps wash water
needed to a minimum. Plant
has a 3" water line to spray
header. Leaves rotate slowly
at 3 rpm so that entire sur-
face of leaf comes in contact
with spray.

As leaves are sprayed,
sludge is removed through V-
shaped trough in bottom. A
6" quick-opening Victaulic
coupling is on bottom of filter
directly over sewer outlet.
Time taken to open a valve
would mean lost production
time.

Filter has a Lock-Ring
quick-opening door on one
end. This eliminates time-con-
suming bolting and affords
quick access for inspection of

filter cake and internal parts.
Door is leakproof as a result
of using a pressure-energized
V-groove seal which tightens
as pressure increases.

Body of filter is 304 stain-
less steel. Screens are 316
stainless and of 60/60 mesh.
Unit has 200 sq ft of filtering
area.

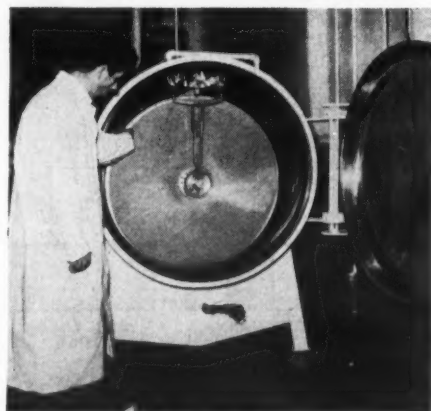
Operation of filter consists
of three basic steps — pre-
coating, filtration, and sluic-
ing or washing. For a precoat,
brewery uses diatomaceous
earth and asbestos fiber. For
body feed, diatomaceous earth
is added by itself in form of
slurry by means of propor-
tioning pump.

About 1/3 lb of diatoma-
ceous earth is used per bbl of
beer filtered. Filter handles
about 800 bbl (31 gal per bbl)
of beer in a five-hour cycle.

Results: Cleaning filter is
now only a 4-5 min job, com-
pared to 1½ hr required pre-
viously. This means that about
25% more production can now
be obtained. It has resulted in
a large monetary saving.

Sprays in present filter clean
unit more thoroughly than
was possible with water hose

To page 89



Door can be quickly
opened to permit in-
spection of interior.
Note cleanliness of unit
which aids plant in pro-
ducing high-quality
product

Operating at giant southern kraft mill, efficient process permits knots and screen rejects to be refined and bleached without need for recocking. Playing big role in the operation, compact pipeline mixer handles 2500 gpm and . . .

Cuts 'Dirt' Content of Pulp Down to 35 ppm

Problem: Process changes in the handling of kraft knots and screen room rejects caused "dirt" content (amount of off-color shives) to rise above maximum permissible limit in finished bleached pulp at Bowaters Southern Paper Corporation, Calhoun, Tennessee. The revisions made in

the process involved new pulp refining and cleaning techniques to permit the rejects to be processed along with the main stock of pulp without having to be recocked.

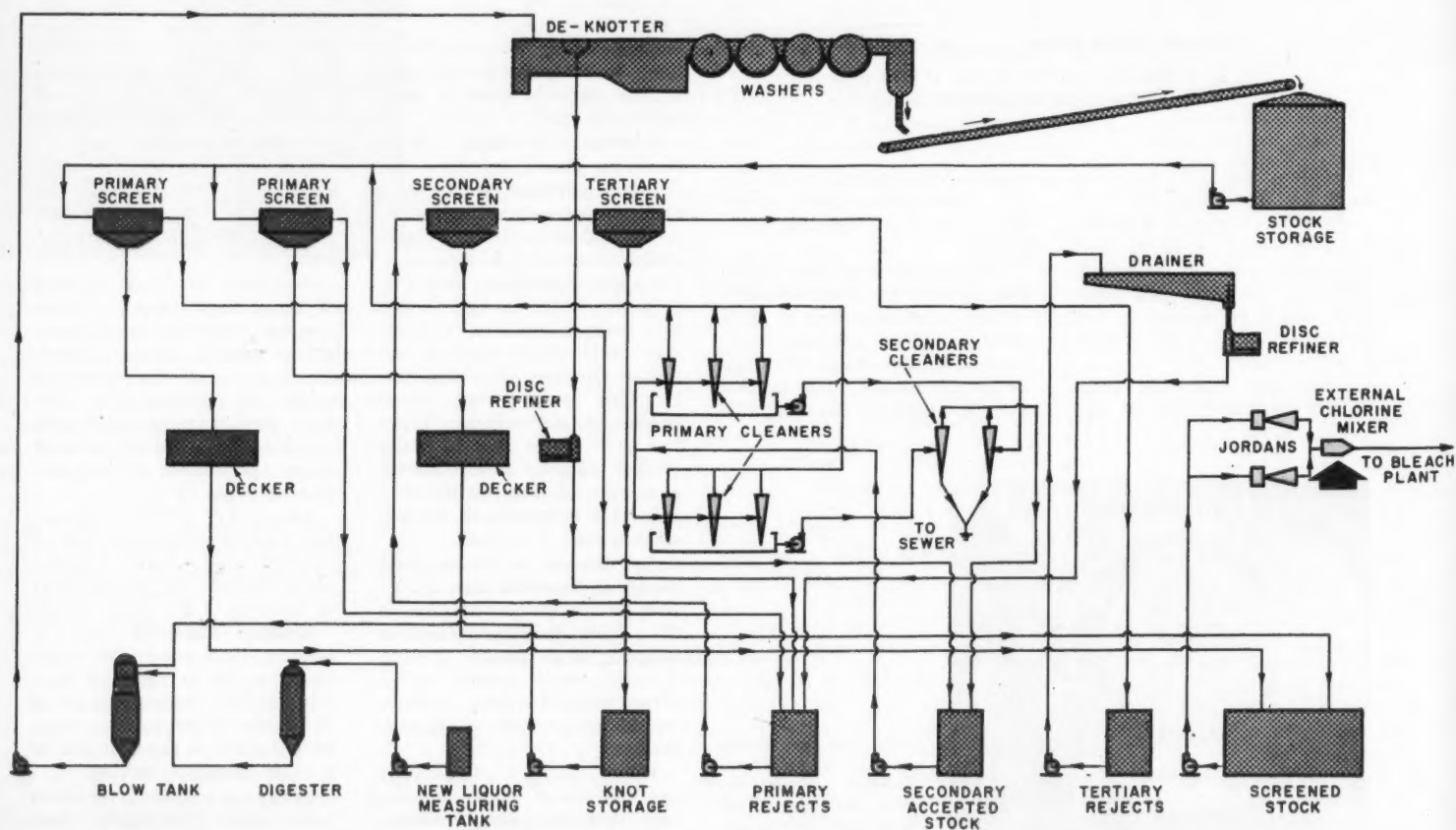
Reclaiming knots and screen rejects in kraft mills producing only bleached grades has long been a problem. In most

cases, the rejects are returned to digesters for recocking. This procedure has many disadvantages which cause operating difficulties as well as non-uniform pulp.

The huge Bowaters mill has a capacity of about 430,000 tons newsprint per year. It can also turn out 50,000 tons per

year of pulp for other uses. Originally constructed in 1954, and expanded since then, the plant is one of the biggest of its kind to be built in the U.S. during the last 25 years. Its total cost ran over \$100 million.

Solution: Studies revealed that although the new pulp

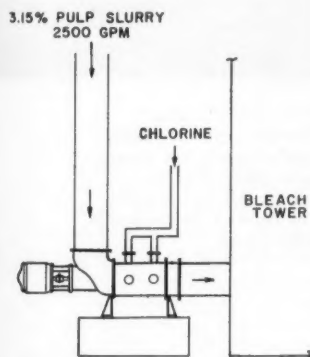


NEW SOLUTIONS of processing problems

by TED F. MEINHOLD, Associate Editor

refining and cleaning techniques were operating satisfactorily, more thorough mixing of pulp and chlorine was necessary if the refined knots were to be bleached. Any partially chlorinated reject appeared as a shive in the finished pulp.

To achieve the desired re-



Mixer is mounted horizontally in 16"-diam pipe just ahead of bleach tower

Flow diagram illustrates how kraft knots and screen room rejects are refined and cleaned without having to be recooked. External chlorine mixer (large arrow) adds, mixes chlorine to pulp prior to entry to bleach plant

sults, engineers installed an external chlorine mixer to supplement the existing chlorine tower circulators. Mounted horizontally in a 16"-diameter pipeline, the unit consists of two mixing stages and one lift stage, and is located just ahead of the chlorination tower. Mixer handles about 2500 gpm of 3.15% pulp slurry. Chlorine is introduced as a gas, at rate of 25-30 lb/min through injection nozzles located immediately behind mixer's impellers.

Unit provides instant, uniform, continuous mixing right in the pipeline. Mixer is well adapted for use where space and head are at a premium. Engineered simplicity of design and rugged construction achieve top efficiency per input-horsepower.

Practically all applied energy is used in a localized zone. Pulp entering eyes of impellers is carried by the vanes, accelerated to a high velocity, and thrown by centrifugal force into an annular channel. Simultaneous recirculation of portion of slurry with injected chlorine provides volumes necessary for optimum dispersion.

Mixer's body is constructed of cast iron and steel. Interior is lined with 3/16" rubber. Bearings are cutless rubber and are provided with flushing water connections. Impellers, shaft, and chemical feed tubes are made of Hastelloy C. Shaft rotation is approximately 900 rpm. Mixer is powered by a motor fitted with V-belt drive.

Results: Dirt content of fin-

ished bleached pulp has been cut down to 35 ppm — well below the maximum permissible limit. Used as a supplement to the plant's conventional bleaching equipment, the pipeline mixer has succeeded in providing the intimate mixing of chlorine and pulp essential to the operation. Kraft knots and screen room rejects are successfully refined and bleached without having to be recooked.

Mixer has operated smoothly and efficiently with only minimum maintenance — mostly of the preventive type. This is generally done during regular plant shutdowns. Shaft and bearings have been replaced twice in over two years' operation.

Bowaters' engineers also report that the mixer has more than paid for itself in emergency service. In case of bleaching tower or recirculator trouble, it is no longer necessary to shut down the mill's three giant paper machines. The mixer has enough volume and does such a good job of mixing that it can satisfactorily feed the machines — although at a reduced rate of flow.

(Homomix pipeline mixers are development of The American Well Works, 118 North Broadway, Aurora, Illinois.)

Check 4069 opposite last page.

Giant chlorination tower (right) is 18½' diam, 65' high. Tower is used to complete chlorination. Retention time is about 40 minutes



C. P. Staff Photo

Installed as supplement to conventional pulp bleaching apparatus, 16" pipeline mixer plays key role in process for refining and bleaching knots and screen rejects in kraft mill. Chlorine is added through small lines at top



Mixer prior to installation in mill. Unit is rubber-lined, has two mixing stages and one lift stage



CP Staff Photo

Packaged Steam Boilers Serve Dual Purpose In Uranium Plant

While economical units provide steam for process heat, flue gases containing CO_2 are used to heat and regenerate ore leaching solution

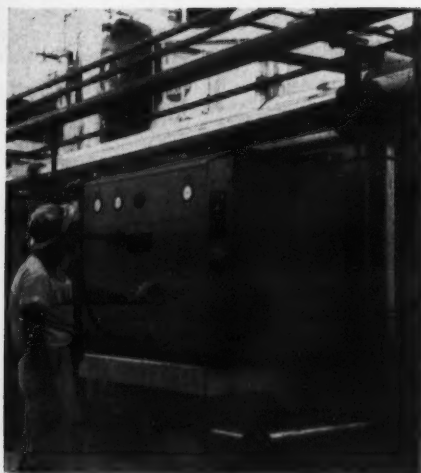


Fig. 2
Operator makes adjustment to No. 4 boiler

GORDON WEYERMULLER
Associate Editor

All steam requirements for uranium ore processing plant of Phillips Petroleum Company in New Mexico are furnished by four medium-size packaged steam boilers. Flexibility obtained with packaged units is particularly advantageous.

Packaged boilers were placed in operation in June 1958. Units furnished steam for process heating. In addition, flue gases containing CO_2 are used to heat ore leaching solution and to restore the sodium carbonate-sodium bicarbonate ratio of solution.

Flue gases pass into a rectangular duct, which transmits hot gases to larger blower.



Fig. 1
Arrows indicate location of two of packaged boilers at uranium plant. Flue gases pass into rectangular duct, then blower, twin carbonating towers, and recarbonated liquor receiving tank. Tower at left center is auxiliary stack

(See Fig 1) Gases are blown to bottom of twin carbonating towers. Mill solution to be carbonated enters towers at top. Gases and solution come in contact in sections of tower packed with Intalok saddles. Carbonated liquor enters mill solution tank. (Right, Fig 1) From tank, liquor is pumped to mill circuit.

Since boilers are operating in a mountainous area at 7000' elevation, they have a forced draft on the intake side. Normally units are fired with natural gas although burners are also equipped to use fuel oil if desired.

Packaged boilers are horizontal gas flow type. Tubes

and baffles are arranged vertically to minimize soot accumulating on surface. Design is compact with a small cross section, providing low overall height and space-saving length and width.

To provide greatest efficiency of heat utilization, all heat absorbing surfaces in furnace are tubing. Floor, sides, and roof of furnace are tangent-tube construction. Boiler comes assembled, ready to mount on a concrete slab.

(W2-33 packaged boiler is product of Power Div., Bros Incorporated, Minneapolis 14, Minnesota.)

Check 4070 opposite last page.



NEW SOLUTIONS of processing problems

Distributing screw conveyor has rack-and-pinion gates at 6' intervals. It discharges to left or right onto traveling screw conveyor that delivers bulk chemicals to any of ten storage bins

Unusual 60-ft-long traveling screw conveyor can be positioned by pushbutton to discharge fertilizer bulk chemicals into any of 10 storage bins at Wasatch Chemical Company. It's part of system to provide . . .

Handling Geared to Meet PEAK-SEASON PUSH



Proper proportions of fertilizer components are loaded into traveling weigh lorry that discharges to floor hopper. Screw conveyor carries it to screening, grinding, and mixing process

The fertilizer business is highly seasonal. That's why the Wasatch Chemical Company plant in Salt Lake City must have large storage facilities and a material handling system adequate to serve these facilities efficiently . . . as well as a batching system that will formulate products fast during peak season.

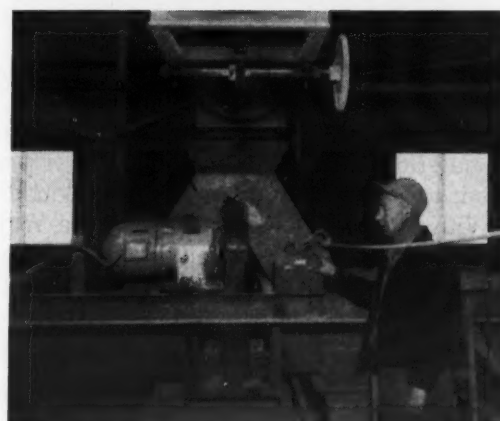
Wasatch produces a complete line of fertilizers for lawn, garden, and farm. The firm also formulates insecticides and fungicides, manufactures detergents, disinfectants, and air sprays, and distributes heavy and fine chemicals within the intermountain area.

Peak season comes in March, April, and May. During this period the company processes everything it can store during the previous nine months, and everything that comes in during the peak period. All this comes in at a relatively constant rate. Production rate during peak season is 25 tons per hour of final fertilizer products.

Ten bins, each with 300-ton capacity, store five basic raw materials — ammonium sulfate, triple super — phosphate, potassium chloride, 20% phosphate, and ammonium phosphate. Conveying and elevating system for transporting bulk chemicals from railroad cars to storage bins is capable of handling 30 tons per hour.

Materials are unloaded from railroad cars into track hopper equipped with grizzly for breaking up large lumps. A 16"-diam screw feeder, 31' long, draws material from hopper and delivers it to centrifugal-discharge bucket elevator, having 48' centers, which carries it up to distributing system atop bins.

Divider gate permits elevator to discharge either directly to processing or to 16"-diam horizontal screw, 84' long, located over center-line of storage bins. This distributing screw conveyor is equipped with rack-and-pinion gates at 6' centers. Chute and divider-gate arrangement



Traveling screw conveyor is positioned, by pushbutton, beneath any of 10 spouts in distributing screw conveyor



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Check 4071 opposite last page

NEW SOLUTIONS

permits discharge to left or right onto traveling screw conveyor which discharges into the bins.

To reduce contamination of the various materials, rack-and-pinion gates are curved to fit contour of bottom of trough.

Traveling screw conveyor is on a carriage which travels on eight wheels along four parallel rails — two at outside extremities of conveyor and two about 6' to left and right of center-line of bins. Using pushbutton control, it is moved along rails and positioned by means of a gearmotor connected by roller-chain drive to one of inboard carriage wheels.

Only one man is required for opening desired gate in distributing screw conveyor and for positioning traveling screw conveyor carriage beneath desired opening.

Inboard portion of traveling screw conveyor is in a closed trough, while outer section at each end is open. As pile builds up to level of screw conveyor, this forms a bed over which additional material travels. Pile is thus built up along length of the traveling screw conveyor.

Batching

Batching operation includes series of batching bins which feed a traveling weigh lorry through hand-operated quadrant gates. After proper proportions of components have been loaded, lorry discharges to floor hopper. A 16"-diam screw conveyor carries chemicals to screening, grinding, and mixing operations. Product is then discharged to baggers.

Through use of this material handling system, designed to meet its specialized need, Wasatch is able to handle its heavy peak load requirements. System makes possible smoother flow of materials, lower costs, and more effective plant operation.

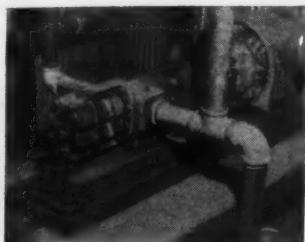
(Material handling system was designed and manufactured by Link-Belt Company, Prudential Plaza, Chicago 1, Ill.)

Check 4072 opposite last page.

CHEMICAL PROCESSING

**External-gear pump
is trouble-free**

Problem: Failure of packing in bearings because of contact with liquid being handled caused repeated damage to pump parts at Louisville Var-



This external gear and bearing type rotary pump has been in service seven years without needing a repair part

nish Company, Louisville, Ky. Pumps were used to unload and transfer lacquer thinner.

Solution: External-gear and bearing-type rotary pump was installed. It has deep stuffing box for ample rings of packing plus large space for heavy packing glands, thereby protecting externally housed bearings and timing gears from liquid contact.

Rotors do not come into contact since they are keyed to shafts and timed through heat-treated steel timing gears, keyed and locked on ends of shafts. Timing gears transmit power to driven shaft — the only contact between rotating elements.

Flexible couplings are used to connect pump direct to motor. Pump is designed to operate at standard motor induction speeds up to 1800 rpm, which eliminates need of reduction gears or belts.

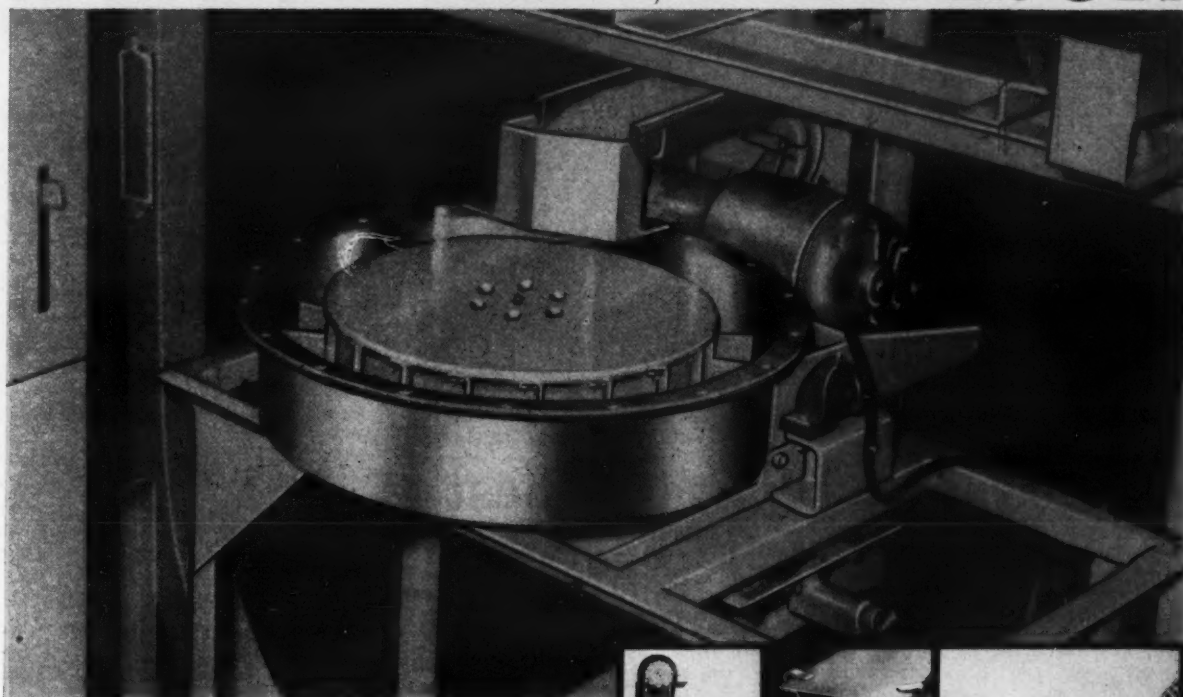
Materials are pumped at 70 to 90 gpm, operating with a 10-ft suction lift against 30 to 40 ft head.

Results: Operation of pump is virtually trouble-free. It has been in service seven years without need of a repair part. Only servicing is annual gland repacking.

(Gearex® pumps are manufactured by Sier-Bath Gear & Pump Co., Inc., 9260 Hudson Blvd., North Bergen, N.J.)

Check 4073 opposite last page.

STEPHENS-ADAMSON

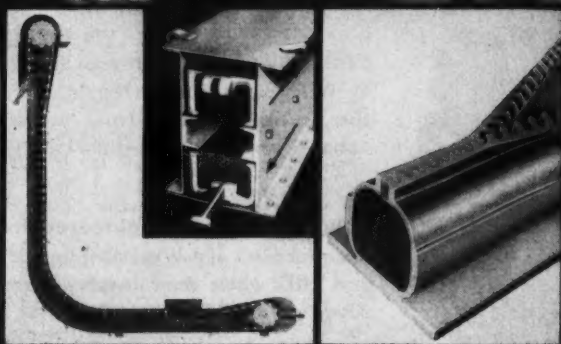


SA CONTINUOUS WEIGHER PROVIDES EXTREME ACCURACY!

The STEPHENS-ADAMSON Continuous Weigher weighs material continuously while in motion with extreme accuracy. Material entrance and exit points are in line with pivot axis of weigher providing for easy installation within existent processing operations and completely eliminating all discharge terminal errors. The unit handles hot material with equal accuracy. Minimum headroom is required. The weigher can be adapted with control equipment for accurate gravimetric feeding without requiring extensive plant alterations. STEPHENS-ADAMSON engineers will be happy to work with you on automating your processing operations.



WRITE FOR
BULLETIN
958



S-A REDLER CONVEYOR S-A ZIPPER CONVEYOR

Skeleton flights, linked together and moving through totally enclosed casings, induce the mass movement of powdered, granular or flaky bulk materials in any direction. Gentle conveying action and sealed casings mean maximum protection for materials handled. Redler units combined with Continuous Weigher offer automatic operation. Request Bulletin 358.

Literally a moving, material-carrying conduct, the zipper closed belt, conveyor-elevator is capable of transporting bulk materials in any plane, to considerable heights and around obstructions. Bulk materials are conveyed free of breakage, agitation or segregation within the sealed and dusttight belt. The zipper combined with Continuous Weigher is ideal for automatic feeding operations. Request Bulletin 349.

**ENGINEERING DIVISION
STEPHENS-ADAMSON MFG. CO.**

GENERAL OFFICE & MAIN PLANT, 11 RIDGEWAY AVENUE, AURORA, ILLINOIS

PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI
BELLEVILLE, ONTARIO

Check 4074 opposite last page

One of six Allis-Chalmers 3,000-lb lift trucks handling chemical products in a western warehouse. Operators like the way they maneuver, even in tight quarters.



**Operators like them best
... drive them best**

ALLIS-CHALMERS FORK TRUCKS



"Feels like a car with power steering," says Arthur B. Wiley, fork truck driver at a Michigan factory. Further, an Allis-Chalmers truck "works fine in narrow aisles. It has no controls on the floor—easy to get on and off of."



"Must have been engineered for the driver," says operator Gast at a Wisconsin foundry. "Shifting is handy and I like where the controls are located. Have plenty of room for driving."



"I just like the whole machine — everything about it," sums up John Cromer, operator at a Missouri plant. "It's a work horse. It handles and operates smoother and performs better than others we have had in the plant."



Outstanding performance starts with the Allis-Chalmers industrial heavy-duty engine. It provides extremely high torque in relation to rated capacity for smoother operation, climbing grades, moving heavy loads.

Be "Years Ahead" with Allis-Chalmers Material Handling Equipment tells more about why operators "like them best . . . drive them best." Send for your free copy — and see your dealer. Allis-Chalmers, Milwaukee 1, Wis.

ALLIS-CHALMERS

BH-1038



Check 4075 opposite last page

Using secret process developed by its own laboratories, and relying heavily on efficient film-type heat exchangers to keep its plant running smoothly, Stauffer's modern Louisville installation . . .

Pushes output

TED F. MEINHOLD, Associate Editor

with **H. C. KUTZ**, Plant Manager
Stauffer Chemical Company
Louisville, Kentucky

One of the most modern chlorinated hydrocarbon plants currently in operation is located on the banks of the Ohio River, a few miles downstream from Louisville, Kentucky. Owned by Stauffer Chemical Company, the installation produces perchlorethylene, methylene chloride, chloroform, and carbon tetrachloride.

The plant uses, along with other advance-design equipment, compact methane and propane direct-chlorination units. Methylene chloride, chloroform, and carbon tetrachloride are produced in the methane chlorination plant. Perchlorethylene and carbon tetrachloride are made in the propane chlorination unit.

Company-developed Process

The process used by Stauffer was developed a few years ago at the firm's research and development center in Richmond, California. Operating details are kept under wraps. Key units in the process are the reactors where chlorination is conducted. Their design is also a heavily guarded secret.

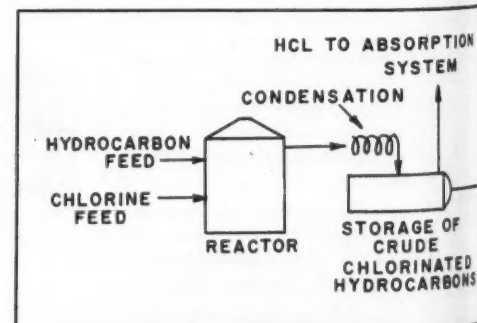


Photos by CP Staff

Generally, here is what takes place in the process: Hydrocarbon feed material is reacted with chlorine to produce crude chlorinated hydrocarbons and about 70 percent pure hydrochloric acid gas. Chlorinated products are separated from the gas, removed from one another in a series of distillation columns, then independently processed through several purification steps, and dried to make products of extremely high purity.

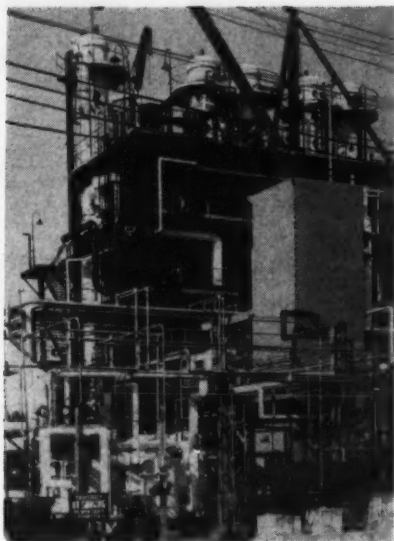
The by-product HCl is sent through an absorption system, purified to 99.99 percent,

Simplified diagram illustrates how chlorinated hydrocarbons are produced at Louisville plant



of chlorinated hydrocarbons

Methane chlorination plant turns out methylene chloride, chloroform, and carbon tetrachloride



Assistant plant manager, A. P. McGuire, stands next to one of the 15'-high film-type heat exchangers in methane chlorination plant

and shipped via direct pipeline to nearby customers.

Film-type Exchangers

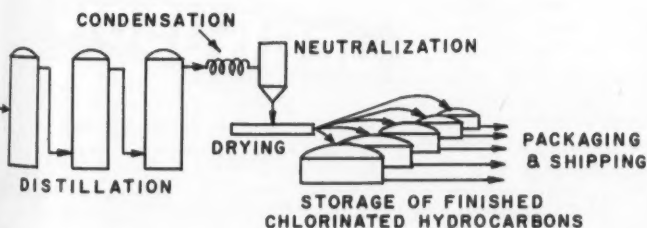
Since considerable cooling and condensing steps are involved in the process, heat exchangers play an important role. Excellent performance has been given by film-type heat exchangers using water as cooling medium.

Units are vertical, single tube-pass design with water falling in a film on inside surfaces of tubes. High efficiency obtained with this type of exchanger results from the fact

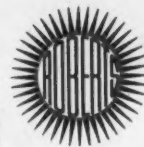
that heat transfer coefficients of fluids in film flow are about twice as high as those obtained in full-tube flow. Water enters through open water box on top of unit and discharges from bottom of exchanger into drain below.

Effective film-type flow and proportioning of equal amounts of water to tubes is obtained by use of special distributing ferrules on top of each tube. Ferrules installed at Stauffer were specifically designed for use in chlorinated hydrocarbon service.

Film-type exchangers installed at Stauffer vary in heat



PERFECT CRYSTALS



every time!

ROBERTS CENTRIFUGALS

Is yours one of the growing number of end products whose value hinges on perfect crystal structure? Do you strain to form them, only to lose them during centrifuging? Then, by all means, examine the Roberts Centrifugal!

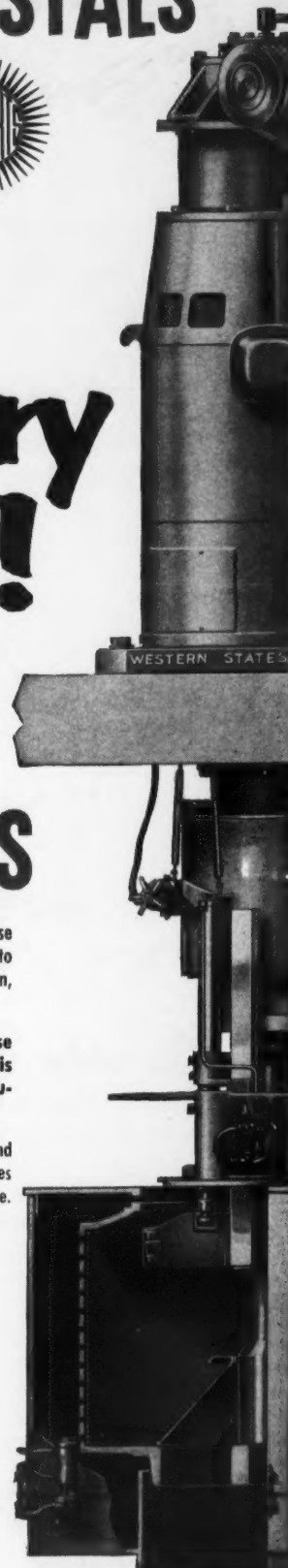
Our slow speed discharge, 35 r.p.m. (in reverse rotation, for safety's sake) enables us to make this promise, unmatched by any other centrifugal manufacturer . . . "NO CRYSTAL DEGRADATION!"

All cycle components are pneumatically operated, too, and this feature eliminates the possibility of introducing impurities into the product through lubrication or hydraulic leakage.

Full information? FREE! Ask for Bulletin No. 2775.

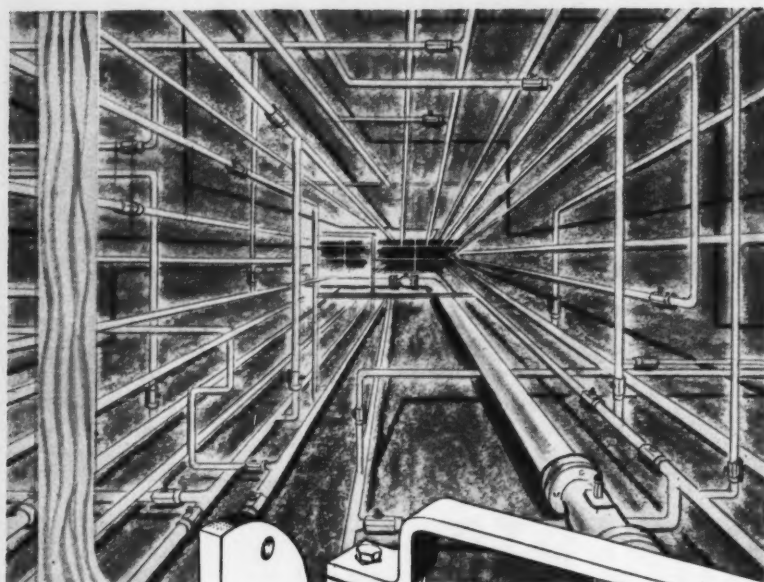


2775



Check 4076 opposite last page

Jamesbury "Double-Seal" Ball Valves Give Double-Value



Double - LIFE

The unique concept of the "Double Seal" Ball Valve itself spells far less wear, far less care, much more useful life.

Ball valves in pipe sizes $\frac{1}{4}$ " to 8" in Bronze, Aluminum, Stainless Steel, Carbon Steel and PVC. Quarter Turn.

Distributors In Principal Cities.

Get The Complete Facts On The Jamesbury "Ball Valve" Principle.

682-8

Name _____ Title _____

Company _____

Address _____

City _____ State _____

☐ Jamesbury Literature
☐ Distributor Service

JAMESBURY CORP., 65 NEW STREET, WORCESTER, MASS.

Check 4077 opposite last page

NEW SOLUTIONS

transfer surface. Seven units used in the methane chlorination plant range from 426 to 1230 sq ft of surface. All have $15'-1\frac{1}{2}"$ overall height, but inside diam varies from $17\frac{3}{8}"$ to 28". Tubes are 1" OD No. 12 BWG seamless Monel.

Three of the exchangers, each with about 400 tubes, condense chlorinated hydrocarbon gas mixture, dropping temperature from 75 to 40°C.



Checking water box on top of heat exchanger

Three others, also with approximately 400 tubes, are used in distillation plant, cooling product from about 70 to 40°C. Smallest condenser has 140 tubes, cools from 60 to 40°C.

All the exchangers have carbon steel tube sheets faced on tube side with $\frac{1}{8}"$ minimum Monel weld deposit. Shells are either rolled carbon steel or seamless carbon steel pipe. Each shell has an expansion joint to allow for thermal expansion between shell and tubes. The carbon steel water boxes and channels are protected with a bitumastic coating.

Simple and sturdy construction result in low initial cost and assure many years of trouble-free operation. Film-flow design provides top efficiency and keeps cooling water consumption to minimum. In operation at Stauffer for well over a year, none of the exchangers has ever developed a leak. If a leak should occur, product in shell side will never become contaminated by water in tubes, since pressure exists only on shell side.

As a safety precaution, pH alarms have been installed in

To page 42

New Improved JERGUSON Gage Illuminator

**gives up to
3 times the
illumination**

Low cost explosion-proof lighting of entire gage glass with no glare or blind spots

New Features:

Simplified Relamping . . . loosen one thumb screw to lift out cover and glass housing in one piece.

New Safety Chain prevents accidental dropping.

Now both UL and CSA Approved.

Easily mounted on back of Transparent Gage.



The New Jerguson EPL-56 Illuminator gives three times the illumination (and 3 times the bulb life) . . . a bright, evenly diffused light over the entire length of gage glass, thus enabling you to see the liquid level clearly and easily under all conditions. Relamping is simplified: one turn of the thumb screw and you lift out cover and glass housing in one piece.

Jerguson Illuminators incorporate the principle of solid wedge lighting. Illumination from a single bulb is reflected from the angular surface of the plastic wedge and is evenly diffused through the transparent gage glass.

Jerguson Illuminators are UL approved and are built in accordance with their Standard for Electric Lighting Fixtures for use in hazardous locations for Class I, Group D Services. They are made in a variety of sizes.

Write for Data Unit on Process Gage Illuminators.

JERGUSON

Gages and Valves for the Observation of Liquids and Levels

JERGUSON GAGE & VALVE COMPANY
100 Adams Street, Burlington, Mass.

Offices in Major Cities

Jerguson Tress Gage & Valve Co., Ltd., London, Eng.
Pétrole Service, Paris, France

Check 4078 opposite last page

CHEMICAL PROCESSING

FOR CATALYTIC REFORMING

4 B&W Refractory Castables with low iron content

B&W Kaocast

Ten years ago, B&W introduced this 3000° castable which offers a combination of high temperature use limit, as well as very low iron content. B&W Kaocast can either be gunned or cast in place.

B&W Kaocrete-LI

After two years of extensive field service, B&W adds Kaocrete-LI to low iron content castables. B&W Kaocrete-LI, which has an iron content of less than 1%, has exceptionally high strength for resistance against abrasion and erosion. It has sufficient refractoriness for use at temperatures to 2700 F. Suitable for both gunning and casting.

B&W Kaolite-LI

Another new castable with over two years of field service, B&W Kaolite-LI has high insulating properties due to its light weight (only 59 pounds per cubic foot). Its iron content is also less than 1%. It is designed to be applied with a cement gun only. Installation and maintenance time can be cut since Kaolite-LI does not require water curing and heat can be applied directly after gunning.

B&W Kaocrete-32

Developed for special high temperature service, B&W Kaocrete-32 has extremely high strength and a use limit of 3200 F. It can be poured, plastered or gunned into place.

Properties of B&W Low Iron Content Castables

		B&W Kaocast	B&W Kaocrete LI	B&W Kaolite LI	B&W Kaocrete 32
Use limit, °F		3000	2700	2300	3200
Melting point, °F		3200	3100	2700	3297
Average density lb/cu ft after firing		126	131	59	134
Average % Fe ₂ O ₃		1.0	0.9	0.8	1.0
Cold crushing strength— psi average— after heating for 5 hrs. at:	1000 F	700	2500	350	1000
	1500 F	500	2500	350	800
	2000 F	400	1200	300	750
	2200 F	500	1300	450	1000
	2400 F	500	1600	—	2000
	2600 F	1000	6000	—	3000
	2800 F	2200	—	—	3500
	3000 F	3500	—	—	4000
	3200 F	—	—	—	5000
Permanent linear shrinkage— average % less than— after heating for 5 hrs. at:	1000 F	0.3	0.2	0.3	0.2
	1500 F	0.3	0.2	0.4	0.2
	2000 F	0.5	0.2	0.4	0.2
	2200 F	0.5	0.2	0.6	0.4
	2400 F	0.5	+0.1	—	0.5
	2600 F	0.5	—	—	0.5
	2800 F	0.5	—	—	0.5
	3000 F	0.3	—	—	0.2
	3200 F	—	—	—	0.1

Consult your B&W Representative for additional information on these and other B&W Refractories for the refining industry.

B&W REFRACTORIES PRODUCTS: B&W Allmol Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars • B&W Silicon Carbide



SR-4[®] LOAD CELL

MEASURE WEIGHT, THRUST AND LOAD THIS MODERN WAY

B-L-H SR-4 Load Cells offer a dependable, accurate way to measure weight, thrust and load. Rugged and compact, they operate accurately under widely diverse conditions and are used to measure jet and rocket engine thrust, to determine center of gravity, to weigh loads at rest or in motion, and to control batch and continuous processes. Output permits local or remote instrumentation . . . indicators, recorders, printers, etc.

Available with capacities of from 50 to 200,000 lb. (compression) or 50 to 100,000 lb. (tension or compression), standard SR-4 Load Cells may be furnished with calibration accuracies of either $\pm 0.25\%$ or $\pm 0.10\%$ of rated capacity, depending on your requirements. Special capacities and/or characteristics can be furnished on order.

SR-4 Load Cells use accurately-matched SR-4 Bonded Strain Gages to detect the minute dimension changes of a central load column under tension or compression. They are hermetically sealed, are unaffected by dust, grease, moisture, corrosive atmospheres, etc.

For more data on B-L-H SR-4 cells, write Dept. 16-C for a copy of Bulletin 4301. Or let us send a B-L-H man to see you at your convenience.



SR-4[®] LOAD CELL ADVANTAGES

- No moving parts
- High accuracy and repeatability
- Rugged, compact construction
- Long, economical service life

FIRST in force measurement

BALDWIN · LIMA · HAMILTON

Electronics & Instrumentation Division

Waltham, Mass.

SR-4[®] Strain Gages · Transducers · Testing Machines



NEW SOLUTIONS

Heat Exchangers

From page 40

the 200-gpm closed cooling water system serving the heat exchangers. If pH should drop below 4 or 5, water would automatically be discharged into controlled dump area for neutralization.

Since water serving the units is treated, it has never been necessary to clean tubes. However, if it ever does become necessary, tubes can be cleaned while in operation. Water-distributing ferrules at top of tubes need only be removed to permit introduction of cleaning tool.

Cleaning shell side presents a more difficult problem. It will require heat exchanger shutdown when this job becomes necessary. The solid chlorinated organic deposits lodged in shell will then have to be removed by chemical cleaning. If this doesn't work, dismantling and mechanical cleaning methods will probably have to be used.

(Further information about chlorinated hydrocarbons may be obtained from Stauffer Chemical Company, 380 Madison Ave., New York 17, N.Y.)

Check 4081 opposite last page.

(Film-type heat exchangers were manufactured by Henry Vogt Machine Co., Incorporated, 1000 Ormsby Street, Louisville 10, Kentucky.)

Check 4082 opposite last page.

WANTED: NOMOGRAPHS — WORTH \$20 EACH!

Do you have a pet nomograph that could save time for other **CHEMICAL PROCESSING** readers? If so, send it neatly and accurately drawn, with a double spaced, type-written description to:

Data Editor

CHEMICAL PROCESSING

111 E. Delaware Place
Chicago 11, Illinois

We will pay \$20 for each one accepted and published.

CHEMICAL PROCESSING

PROCESS PIPING POINTERS

Plastic piping gets wider usage on process fluids

Now pressure-temperature rated in sizes 1/2 to 2 in. incl., flexible polyethylene pipe of virgin material is getting wider application for both corrosive and non-corrosive fluids handling. Durable, leak-proof joints—plastic-to-plastic or plastic-to-metal pipe and valves—are assured with modified polystyrene insert fittings. Installation is fast, low-cost; one man can handle with simple hand tools. Ask for Circular AD-2205—See below.

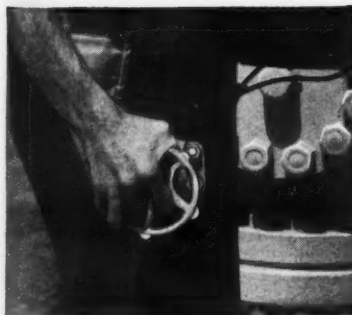


"Choosing the Right Valve"—good refresher for piping engineers

This authoritative handbook gives you, in "boiled-down" form, basic data on valve design and the operating characteristics of each type. Includes notations on adaptability to specific service conditions. Twenty pages—completely illustrated. Useful to valve specifiers and buyers. Your copy sent free. (High-interest motion picture on same subject available for plant showings.) See below.



For severe throttling, you can't beat the plug type disc and seat



After much trouble due to the plug and seat cutting out in valves on gas scrubber blowdown service, this large gasoline plant switched to a globe valve with plug type disc and seat. The results were surprising. Read the facts in the Crane ad on the next page.

For literature or data on product listed above, please contact
J. E. Bradbury, Manager,
Chemical Sales Dept. No obligation.

CRANE CO.

Gen'l Offices: 836 S. Michigan Ave., Chicago 5
VALVES • FITTINGS • PIPE
PLUMBING • HEATING • AIR CONDITIONING
Branches and Wholesalers Everywhere



processing and engineering data

251

Effective Orifice Area for Pressure Relief Device

R. D. BIGGS

Midland, Michigan

This nomograph gives effective orifice area of a pressure relief device for discharge of a vapor according to the equation:

$$A = \frac{Q}{306 \lambda P \sqrt{\frac{M}{T + 460}}}$$

where

A = effective orifice area, sq in

Q = rate of heat input, Btu/hr

λ = latent heat of vaporization of stored liquid, Btu/lb

P = absolute pressure of vapor at inlet conditions, psia

M = molecular weight of vapor

T = temperature of vapor at inlet conditions, °F

This equation, the API-ASME Code formula, is applicable to selection of pressure relief devices designed to protect tanks containing volatile liquids.

The value of Q depends upon exposed surface area of tank and an arbitrary choice of value of heat flux. The literature reference contains a review of the various methods which have been recommended for calculating Q.

The formula is based on the adiabatic, reversible expansion of an ideal gas through a well-designed pressure relief device (coefficient of discharge = 0.97) where a sufficient pressure differential is available to insure critical flow.

The orifice area so calculated will be conservative for real gases.

Typical Example

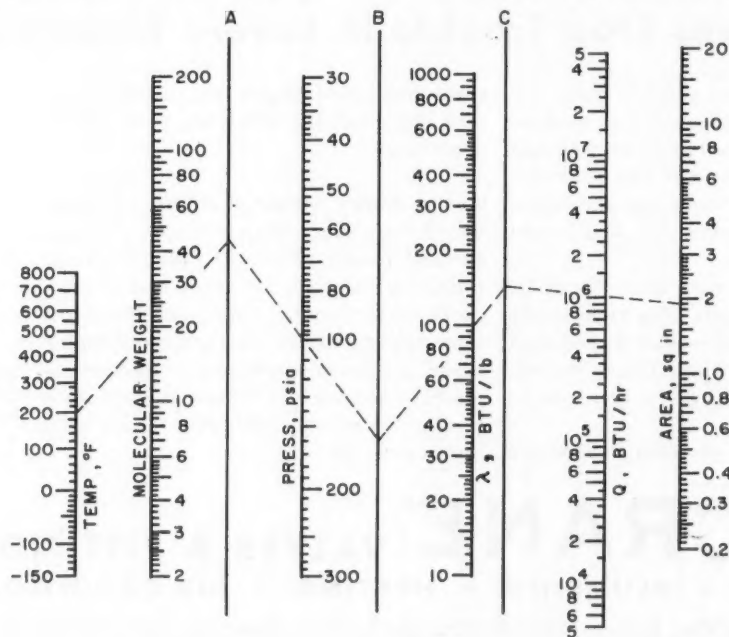
To solve the formula connect the value of the temperature with the molecular weight to intersect the reference scale A.

Connect this point on scale A with value of absolute pressure to intersect reference scale B. Connect this point with value of latent heat to intersect reference scale C.

Connect this point with value of heat absorption rate to obtain value of effective orifice area required.

LITERATURE

SYLVANDER, N. E., and KATZ, D. L., "Design and Construction of Pressure Relieving Systems," *Petroleum Processing*, July, August, September, 1948.



Gasoline plant changes valves...ends leaks...saves money



Crane Valves Stop Trouble in Severe Blowdown Service

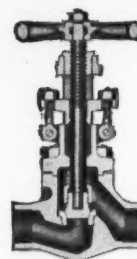
This large Southwestern gasoline plant was troubled by leaky plug type valves used on 900-pound blowdown service lines from gas scrubbers. Water, scale, dirt and other foreign matter cut out the plugs and seats. Valve maintenance costs rose and scrubber efficiency dropped.

It's more than a year since the plant replaced the more costly plug type valves with Crane 1-inch, 600-pound forged steel globe valves. Today these Crane valves, operated several times daily, continue to seat tightly.

With the leakage problem licked, the

plant has saved money on maintenance, and improved the efficiency of scrubber operations.

Got a leaky valve problem of your own? Your Crane Man will have the economical answer. He and Crane have been providing solutions to valve and fittings problems for many years—all based on thorough knowledge of oil and gas industry needs...Crane know-how in design and manufacturing...Crane dependable quality. Take it up with your Crane Man on his next call.



Rugged Crane 600-pound globe valve seating is famous for resistance to foreign matter and wire-drawing. Better design and materials do it!

CRANE® VALVES & FITTINGS
PIPE • PLUMBING • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Ill.—Branches and Wholesalers Serving All Areas

Check 4084 opposite last page

NEW SOLUTIONS

Tinted plastic glazing, highly stable to light, cuts temperature

Virtually eliminates breakage of glass in plant

Problem: Minimizing solar heat while at the same time providing maximum amount of natural illumination confronted Firestone Tire & Rubber Co. in planning construction of new plant at Noblesville, Ind.

One of the penalties of conventional glass window installation is considerable solar heat which, combined with dozens of curing presses and other steam-heated equipment in constant use, would give a "greenhouse effect" to the inside of the building.

Also, the company sought to avoid glass breakage experience at an existing plant on the same site where breakage averages about 12 panes weekly. Replacement costs are estimated at \$2.75 per pane.

A different method of glazing was therefore sought to minimize the greenhouse heating effect, give maximum illumination, and eliminate as much as possible high glass breakage.

It was discovered that many types of plastic glazing which utilize polyester resins exhibit limited light stability and weather resistance. The ultraviolet rays in sunlight were found to accelerate deterioration of molecular structure, causing reduced mechanical strength and a gradual yellowing and reduction in light transmission and surface gloss.

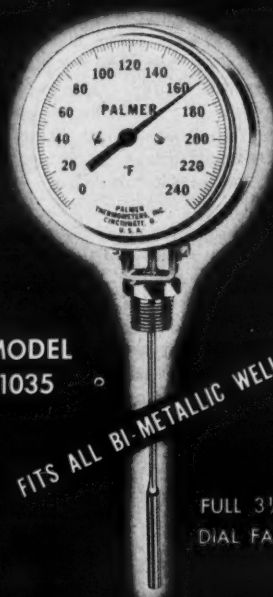
Solution: Nearly 5000 green-tinted 24 x 16" panes of translucent glass-fiber reinforced material based on an acrylic-modified polyester resin were installed in new plant when it was built. Building is 660 ft long, 128 ft wide and 25 ft high, and was equipped with bands of plastic glazing around four sidewalls.

Plastic panes were inserted in aluminum frames using metal clips and glazing compound with aluminum tint to eliminate need for painting after installation.

Acrylic-modified plastic

To page 46

Outstanding Accuracy PALMER Dial Thermometer



Check these functional features

- Direct-drive Bourdon Coil with a filled system for longer lasting accuracy.
- Stem can be placed at any desired angle and case can be rotated to most readable position.
- External calibration for zero setting.
- Unaffected by stem alignment.
- Accurate to one scale division.
- No sticking at any temperature.
- Non-corrosive case.

PALMER

THERMOMETERS, INC.

Mfrs. of Industrial Laboratory,
Recording and Dial Thermometers
2515 Norwood Ave., Cincinnati 12, O.

Check 4085 opposite last page

MARCH 1959



processing and engineering data

252

API Gravities of Asphaltic Materials

E. F. ROQUE

Shell Oil Company
Houston Research Laboratory, Houston, Texas

In determining API gravities of heavy hydrocarbon fractions (asphalt), it is necessary to have an extremely high bath temperature in order to obtain a reading on a hydrometer. It is necessary to go through a rather complicated procedure to correct the readings to 60°F.

In such cases, the manual¹ does not have a simplified table to use. Once a reading is obtained, it is necessary to read two tables and go through a three-step calculation. Calculation involved is as follows:

$$x = \frac{141.5}{\frac{y}{z}} - 131.5$$

where

x = °API at 60°F

y = sp gr at observed API at 60°F (corrected for meniscus)

z = group factor at observed temp
Accompanying nomograph solves above equation in one setting of straight edge.

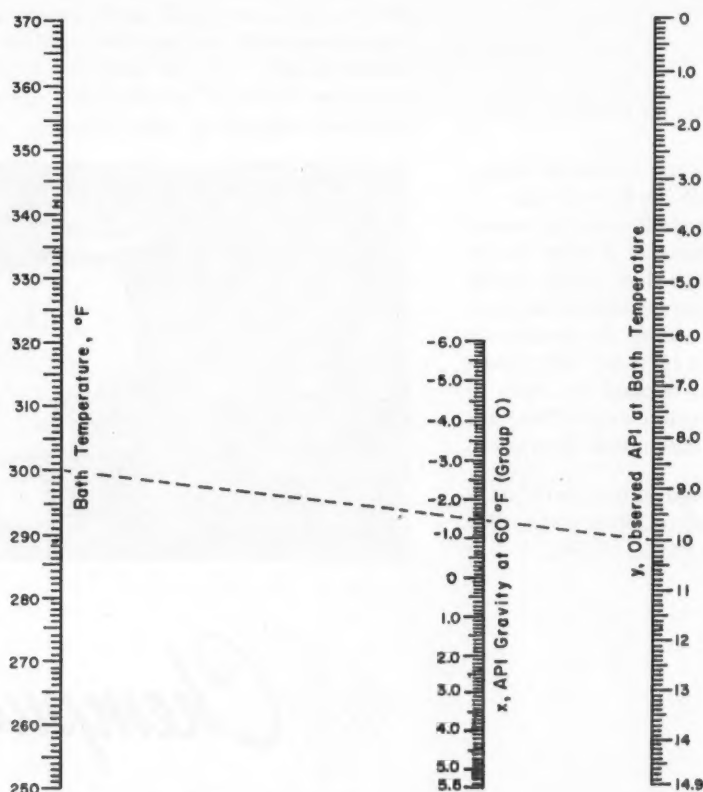
Typical Example

What is API gravity of an asphalt at 60°F if API gravity is 10.0 (corrected for meniscus in hydrometer) at 300°F?

Connect 10.0 on API observed scale, y with 300°F on temperature scale. Intersection with corrected API scale at 60°F, x, gives API gravity of -1.5.

LITERATURE CITED

- 1) "Fisher-Tag Manual for Inspectors of Petroleum," 28th ed.



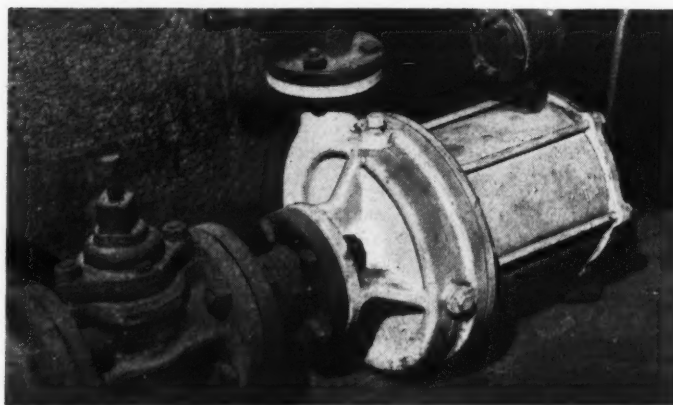
THE BEST PUMP FOR LEAKPROOF SERVICE

*Chempump eliminates
costly and dangerous
carbon tetrachloride leakage*

Proved by this installation . . . at the chlorinated products plant of a major chemical company, Chempumps are used to handle carbon tetrachloride. Conventional centrifugals, formerly used to pump the fluid from storage tanks to drums and tank cars, ran up maintenance and downtime costs . . . were constantly leaking. Chempumps—the best pumps for leak-proof service—solve solvent leakage problems . . . save users thousands of dollars per year.

Here's how: Chempump combines pump and motor in a single, leakproof unit . . . no stuffing boxes or shaft sealing devices are required. Available in a wide choice of materials and sizes, they handle fluids ranging from Dowtherm to liquid oxygen. Chempumps are in use by the thousands . . . demonstrating every day why these field-proven pumps, backed by years of design and construction experience, are your assurance of dependable operation.

Write now . . . for "request for quote" data sheet . . . to Chempump Corporation, 1300 E. Mermaid Lane, Phila. 18, Pa.



Chempump

First in the field...process proved

Check 4086 opposite last page

NEW SOLUTIONS

From page 44

glazing used in the plant reflects many of advantageous properties of acrylic plastics, especially weather resistance, light stability, optical qualities, and mechanical strength.

Results: Interior plant temperature has been reduced to point where it averages 15 degrees cooler than other plant on same site, although both have comparable steam-heated equipment.

Window breakage has been all but eliminated. Although cost of plastic pane is about 25% higher than that for glass, differential is made up as soon as plastic has withstood one impact that would have broken ordinary window. In addition, only one pane in the nearly 5000 installed was broken during construction, compared with 5-10% breakage normal for ordinary glass.

Up to 98% of ultraviolet radiation and more than 50% of infrared rays are screened out, leaving plant interior bright, free of annoying dazzle and glare and excessive heat.

Additionally, plastic glazing was used extensively in one wall which is intended as an expansion wall. Because of the amount used, old wall can be quickly removed at a minimum of cost and wasted material because glazing panels can be reused.

(Structoglas A panels are manufactured by International Molded Plastics, Inc., 4387 35th St., Cleveland, Ohio.)

Check 4087 opposite last page.

(Paraplex P-444 acrylic-modified polyester resin was developed by Rohm & Haas Co., 721 Locust St., Philadelphia, Pennsylvania.)

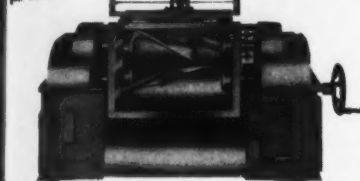
Check 4088 opposite last page.

NEXT MONTH

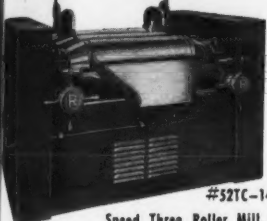
Ever figure that ordinary marbles could play big role in improving community relations? Used in dust collector at an Indiana fertilizer plant, they've helped whip a serious air pollution problem. Watch for the story in next month's New Solutions section.

Leading mfrs. of
Koss MIXING AND
GRINDING EQUIPMENT
for over 90 years

• 1 pint to 150
gal. sizes.



#411-10 Gal. Double Arm Kneader with two speed brake motor. Jacketed trough and motor operated lift optional.



• 4 1/2 x 10, 6 x 14, 9 x 24, 12 x 30, 14 x 32, 16 x 40" sizes.

#527C-14" x 32" High

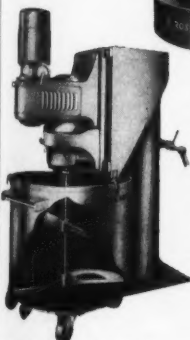
Speed Three Roller Mill. Hydraulic adjustment and pressure recording gauges optional.

#30C-50 Gal. Heavy Duty Change Can Mixer.

Adjustable outer scraper, cover with charging port, and gates on cans optional.



• 8, 16, 20, 50 and 60 gal. sizes.

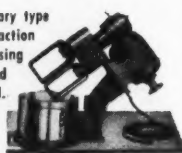


#130H-250 Gal. Change Tank Mixer with hydraulic raising and lowering and variable speed motor. Various type stirrers and high speed impellers optional.

• 80, 150 and 250 gal. sizes.

#130EL-1 Gal. Double Planetary type Change Can Mixer with shearing action stirrers, and variable speed reversing type motor. Jacketed cans and portable trucks for cans optional.

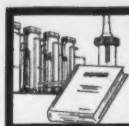
• 1, 2, 3, 4, 6, 15, 25, 50, 65, 110 and 150 gal. sizes.



Write for complete information on these or other types of **Koss** equipment.

**CHARLES ROSS & SON
COMPANY, INC.**

154 Classon Avenue
Brooklyn 5, New York



processing and engineering data

253

Rectangular and Triangular Weirs

J. BRONSON BAYLISS

Asheville, N.C.

A rectangular weir is a simple and inexpensive flow measuring device. Although it is limited to flow in open channels, it is well suited to measurement of waste streams or to any type of surface stream.

Since it is economical to construct and install, it is often used for temporary measurements.

Flow of water through a sharp-edged, rectangular weir can be described by the Francis formula¹:

$$q = 3.33 (L - 0.2H) H^{1.5}$$

where

q = rate of flow, cu ft/sec

L = length of weir crest (horizontal width of rectangular notch), ft

H = head of water measured from weir crest, ft

Although the weir itself is simple, this empirical equation is rather unwieldy. It is well adapted to convenient calculation by nomograph. Figure 1 yields flow in gal per minute when one aligns weir size in inches and head of water, also in inches.

The V-notch or triangular weir is slightly

more complicated than the rectangular weir, but it provides considerably more flexibility. In general, the rectangular weir is suitable for measurement of large flows, but the V-notch is preferable for small flows or where a large range in head is desired.

Flow of water through a sharp-edged, V-notch weir can be described by empirical equation¹:

$$q = 2.505 (\tan \alpha/2)^{0.006} H^{2.47}$$

where

q = rate of flow, cu ft/sec

α = vertical angle of notch, degrees

H = head of water above vertex of notch, ft

Figure 2 has a folded scale for head and flow to provide range of flow from 3 to 3000 gal per minute. Rate of flow on high or low range scale is read by aligning proper V-notch angle with corresponding range on head scale.

LITERATURE CITED

- 1) PERRY, J. H., "Chemical Engineers' Handbook" p 408, 3rd ed, McGraw-Hill Book Co., Inc., New York (1950).

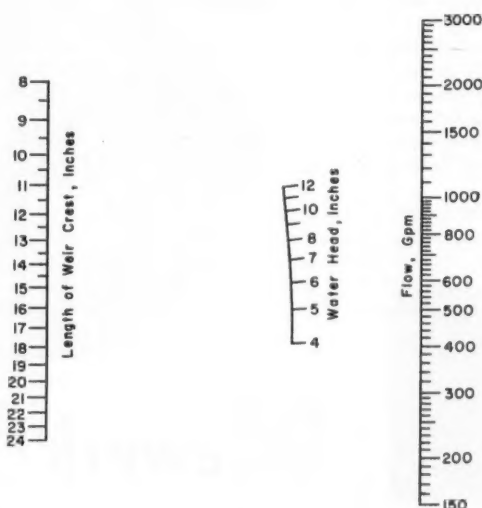


Fig. 1

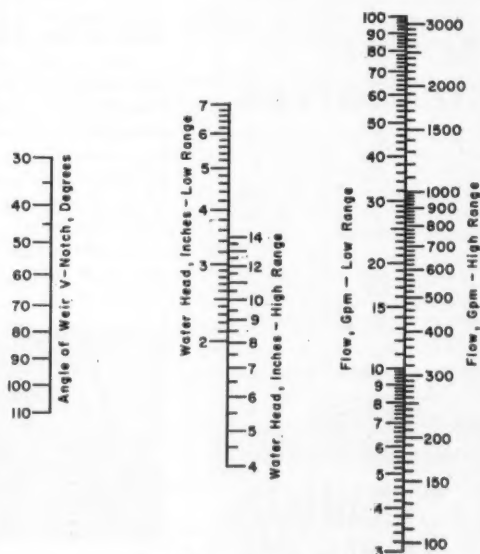


Fig. 2

Check 4089 opposite last page

MARCH 1959

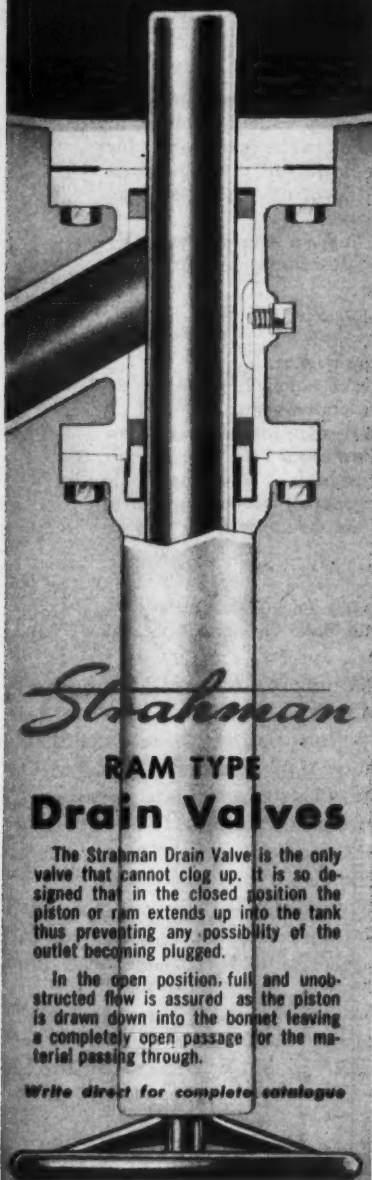
Chemical Processing — March 1959

47

a

FLUSH BOTTOM VALVE
that
WILL NOT CLOG UP

Designed for Chemical and
Pharmaceutical Industries



Strahman

RAM TYPE Drain Valves

The Strahman Drain Valve is the only valve that cannot clog up. It is so designed that in the closed position the piston or ram extends up into the tank thus preventing any possibility of the outlet becoming plugged.

In the open position, full and unobstructed flow is assured as the piston is drawn down into the bonnet leaving a completely open passage for the material passing through.

Write direct for complete catalogue



**STRAHMAN
VALVES, INC.**
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NEW YORK 13, U.S.A.

Check 4090 opposite last page

NEW SOLUTIONS

**Open drip-proof motor
operates successfully
in coolant shower**

Polyester resin protects windings from moisture

Problem: Three totally-enclosed motors burned out, one lasting only five hours, in rugged operating conditions on an aluminum rolling mill at Hunter Engineering Company,



Standard, 5-hp drip-proof motor is hidden by 110°F water soluble oil coolant, flowing over and through it

Riverside, California. Application calls for a five hp, 1800 rpm unit to drive a wire brush that cleans the forming rolls on the mill.

Motor is mounted upside down directly under the rolls and a coolant at 110°F flows continually over and around the motor.

Solution: An open drip-proof motor with encapsulated windings was installed. Polyester resin is extruded through and around motor windings and insulation. This material, called "Multiguard", not only covers coil noses and exterior of slots, but actually surrounds and protects each individual wire. It is impervious to all but a few chemicals.

Before motor was mounted, the end bells were rotated



Motor is mounted upside down directly under forming rolls. Extruded polyester resin protects windings from moisture and harmful chemicals

Newark

TESTING SIEVES

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OPENINGS**

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CREVICES**

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If raw material control, laboratory testing or product control in your plant calls for accurate sieve testing, Newark's Standard Testing Sieves have a definite place in your plant. Made to conform with the latest specification of the National Bureau of Standards and the American Society for Testing Materials, these sieves are extremely accurate, and, as with testing instruments of all types, accuracy is of first importance. Newark Sieves are accurate because among other things the mesh is exact and there are no crevices to catch particles.

Newark Standard Testing Sieves are available in a complete range of sizes and we shall be glad to recommend the best range of meshes for your particular requirements.



**Newark Wire Cloth
COMPANY**

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Check 4091 opposite last page

CHEMICAL PROCESSING

NEW SOLUTIONS

180°, so that vents would be on bottom of motor in its running position. A protective shield was placed over the bottom to keep out foreign materials and three 3/8" holes were drilled in the top. This permits any coolant inside motor to drain out.

Results: The drip-proof motor has been operating successfully for over a year. Installation of this unit has enabled Hunter Engineering to save considerably on maintenance, and has eliminated downtime due to motor failure.

(Drip-proof motor is product of The Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland 17, Ohio.)

Check 4092 opposite last page.

High consistency pulp cuts horsepower needs for NSSC refiners

Vibrating screens play key role in giant paper mill

Lower horsepower needs for pulp refining equipment are being realized through use of efficient vibrating screens at Union Bag-Camp Paper Corporation, Savannah, Georgia. Used to dewater neutral sulfite semichemical (NSSC) pulp prior to its entry to the refiners, the screens reduce moisture content of the pulp from 94 down to 75 percent.

The Process

The plant, considered to be one of the largest of its kind, has a capacity of 2000 tons of paper per day. Unwashed, unrefined pulp is blown from the mill's big digesters and pumped from blow tanks to a battery of six vibrating screens. Fifty tons of unrefined pulp stream over each of the screens daily. Excess liquor is drained off by the high-frequency, small-amplitude vibrations of the screens. Vibrations are produced by a fully-enclosed, self-aligning, roller-bearing mechanism.

Although 40-mesh screens are used in the mill, up to 120-mesh screens can be used



Each dominates in its field— Each with "the teeth that make the difference"

In high speed dispersing with the Cowles Dissolver, those "teeth" mean greater volume, higher quality, complete control—in less space and at lower cost. It's because the unique teeth of the patented Cowles Impeller give the most effective mixing action yet developed. And Cowles scientifically engineered power and drive systems assure you of maximum horsepower delivery—with operational ease at all impeller speeds.

Cowles' exclusive "Multi-Phase" mixing action makes it most in demand for ultimate dispersion, dissolving, emulsifying and deagglomerating in processing solid-liquid, liquid-liquid and gas-liquid materials. Even viscosities in excess of 50,000 centipoises are easily handled by the Cowles. There is no surge, no splash. Easy to clean, too, and the self-cleaning impeller won't clog—you'll save on operator time.

Cowles engineers will be happy to work with you in adapting the Cowles to your materials, processes and present equipment. They can help solve your processing problems economically.

Let us prove it in your plant—at our risk.



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Write today for complete information and catalog.

SEE HOW THE COWLES IS SOLVING THESE PROBLEMS: (Cases from Cowles APPLICATIONS ENGINEERING files)

1-B. Ester Gum Adhesives

Product containing 40% solids of ester gum made at rate of 500 gals. per hour. End product quite stable with particle sizes of less than 4 microns.

1-C. Filter Media Dispersions

Dispersions of diatomaceous earth, asbestos, cellulosic materials and combinations made to improve pressure and vacuum filters requiring an excellent filter coating for optimum results. Users report greatly increased efficiency of filtering equipment and product per man hour.

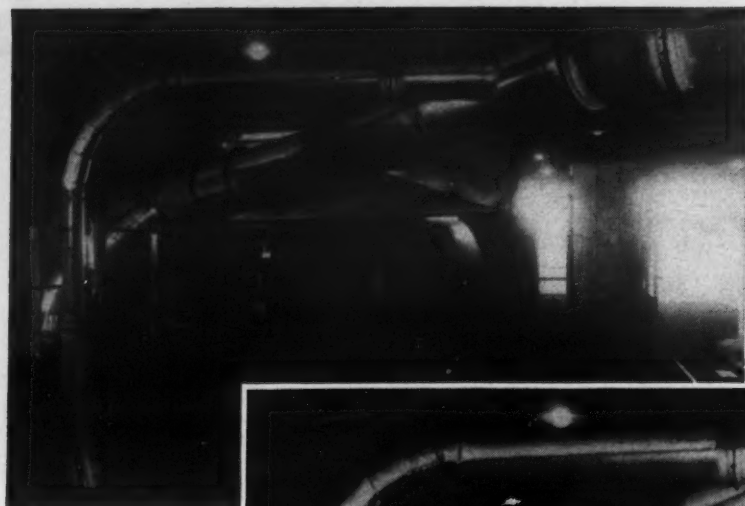
1-E. One Time Carbon Paper Formulas

Formulas including pre-wet iron blue press cake of approximately 35% mineral and 65% pigment being made faster and better. Cowles does quicker, more thorough job of breaking down cake into balance of formula used as application binder.

1-F. Synthetic Fiber Delusterants

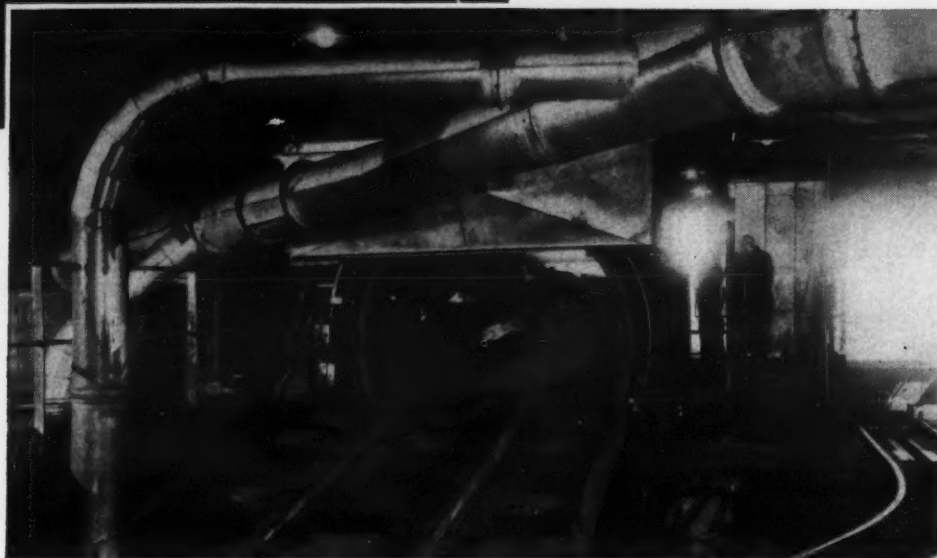
Now made without oversize reject problem (formerly running as high as 30% dry weight of TiO₂) in less than 30 minutes per batch. Elimination of rejects paying for equipment.

Check 4093 opposite last page



BEFORE: Inside the dump house before turning on the Joy Microdyne. Unretouched photo shows how dust laden air creates a choking haze.

AFTER: This unretouched photo shows dump house after the collector has been in operation for 15 minutes. The air has cleared, and dusts are carried through ducting to the Joy Microdyne.



WSW 1 7431-264

JOY MICRODYNE DUST COLLECTOR GIVES CLEAN AIR...EVEN IN COAL DUMP

A large coal mine had a serious dust problem. Coal dust from a rotary car dump would fill the air in the building in which the equipment was housed. Over a period of two shifts, so much dust would settle that the conveyor equipment under the dump would clog with dust. A maintenance man would spend most of the third shift with shovel and broom to clear the accumulated dust.

After a 32,000 cfm Joy Microdyne dust collector was installed, maintenance was reduced to a general once-a-week clean-

ing. By mounting the Microdyne halfway between the car dump and a large crusher house, and connecting them with stainless steel tubing, the one dust collector serves both buildings.

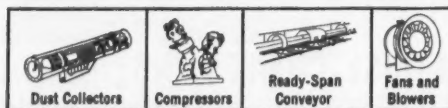
The Joy Microdyne is a new kind of dust collector, 1/10 to 1/20 the size of any other collector. It is extremely efficient and simple to install and is especially suited for conditions encountered in mining and heavy industry.

If your operation has a dust problem, why not talk to a Joy engineer.

Write for
Bulletin 284-80



AIR MOVING EQUIPMENT FOR ALL INDUSTRY



Check 4004 opposite last page

JOY

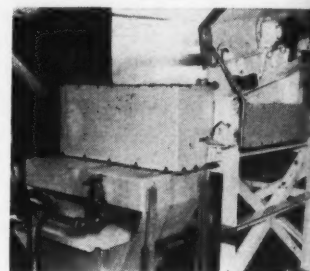
Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company
(Canada) Limited, Galt, Ontario

NEW SOLUTIONS

in other applications. Screens operate smoothly and efficiently, with minimum blinding and maximum liquid flow. Drainage is accomplished in about two feet of travel instead of 10 or 12 feet needed in conventional equipment.

Dewatered pulp from screens is fed to refiners on floor below. Each refiner has a capacity of 50 tons per day of finished pulp. Efficient dewatering achieved by the screens produces a uniform, high con-



Vibrating screen cuts moisture content of neutral sulfite semichemical pulp from 94 to 75 percent

sistency of pulp which results in lower-than-normal horsepower requirements for the refiners.

Semichemical production was started at the Savannah mill in December 1953. The plant boasts six of the world's largest paper machines. It also has auxiliary converting equipment for making and printing paper and board containers. Five of the six paper machines turn out kraft, and one is devoted to semichemical production.

Latter produces approximately 345 tons per day of corrugating medium. Other five machines turn out about 1655 tons kraft paper and board in a typical 2000-ton day.

(NRM-135 vibrating screens were manufactured by Link-Belt Company, Prudential Plaza, Chicago 1, Illinois.)

Check 4095 opposite last page.

For more information on product at right, specify 4096... see information request blank opposite last page.

CHEMICAL PROCESSING



TO MARK PROGRESS



LADISH

Controlled Quality

LIGHT WEIGHT WELDING FITTINGS

developed
for
economical,
dependable
low pressure
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LOWER COST

Substantial savings realized in purchase price of fittings and pipe.

REDUCED WEIGHT

Important weight reductions achieved by reducing wall thickness to correspond with service requirements.

GREATER FLOW

Larger inside diameter provides increased flow capacity.

EASE OF INSTALLATION

Reduced weight facilitates handling ... speeds installation.

AVAILABILITY

Stocked in sizes 4" through 24". Wall thicknesses range from .188" to .250".

CONFORMITY TO SPECIFICATIONS

These fittings meet all requirements of ASA Code for Pressure Piping B31.1—1955 and B31.1.8—1955, ASTM A234 and ASA B16.9.



Lower purchase cost ... reduction in weight ... economy and ease in installation ... increase in flow capacity—these are multiple advantages gained in using Ladish Light Weight Seamless Welding Fittings.

These Light Weight Fittings have been developed and produced under rigid metallurgical and manufacturing standards as part of a continuing program to meet the specific needs of industry for economical, functionally designed fittings.

Specification sheets on Light Weight Welding Fittings and Flanges available on request.



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The Arithmetic of Materials Handling



Fuller Airveyor unloads wood flour to two forty-five foot silos. Second Airveyor system reclaims material 360 feet to processing.

General Electric Changes From Bags to Airveyor ... Cuts Handling Costs 60%

As part of a program to increase plastics production and reduce operating costs at its Pittsfield, Mass. plant, General Electric Company called in Fuller engineers to design systems for handling wood flour in bulk.

Wood flour—used as a filler in phenolic molding compounds—was being handled in 75 and 100-pound bags. Unloading one carload of bags required 16 manhours. Bags were loaded on dollies and wheeled to a distant elevator.

SAFETY FIRST—The two pneumatic Airveyor® materials handling systems, engineered and manufactured by Fuller Company, were installed by its parent company, General American Transportation Corp., providing undivided responsibility. This installation resulted in a 60% saving in handling costs! The two systems

are handled by one full-time and one part-time operator. Manhours to unload one car have been reduced from sixteen to six!

In addition, all equipment is designed to conform to strict safety specifications set down by G-E engineers.

FLOW YOUR MATERIALS—The Airveyor is a system that flows your material through sealed pipes. It's fast, safe, and self-contained. The pipes can be placed close to ceilings, run underground or through walls.

Whether you process wood flour—or other dry granular materials—look into the many economies of Airveyor conveying. Write today for interesting, detailed literature on Airveyor and other Fuller pneumatic materials handling systems.



G-196
1304



FULLER COMPANY

136 Bridge St., Catasauqua, Pa.

SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
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"See Chemical Engineering Catalog for details and specifications".

Check 4097 opposite last page

**Drying time halved,
solvent recovered
as bonus saving**

Tumbling-action dryer saves
pulverizing step

Problem: A heat-sensitive chemical compound was dried in open-tray type ovens, removed, and conveyed to a pulverizer for sizing, in a time-consuming operation at the Lodi, N.J., plant of Fine Organics, Inc. No recovery of solvent was made.

Solution: Company installed vacuum-tumble drying equipment, including jacketed, 20-cu-ft dryer. Since solvent is contained in a waxy compound, precise temperature and vacuum limits had to be established and maintained. These were determined in laboratory and production testing.

Tumbling action during drying provides necessary size reduction for end use of product. Complete drying is accomplished by baffle arrangement in jacket, which maintains even, constant flow of hot water around vessel.

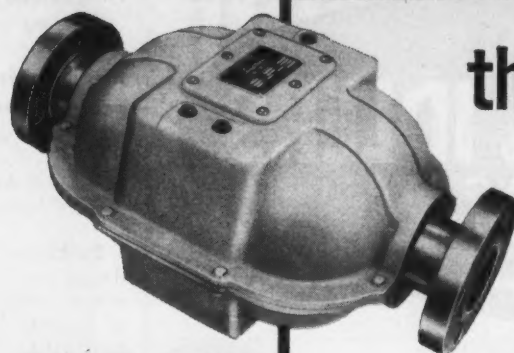
Rapid generation of vapors within vessel, producing scrubbing effect on surfaces, also has considerable affect on heat transfer rate. After drying, compound, reduced to pea-sized granules, is discharged into shipping drums. Quick-opening covers facilitate charging, discharging, and maintenance.

Results: Combination of two steps into one cuts operation time in half. Dryer permits 25 to 30 gal solvent to be recovered from each batch of material. This saving (\$30 per batch) and reduced labor and material-handling cost are expected to total \$3500 to \$4000 annually.

Dryer requires little or no attention except occasional check on temperature and vacuum. Installation occupies 10 x 5' of floor space.

(Vacuum-tumble dryer is a product of The Patterson-Kelley Company, Inc., 105 Warren Street, East Stroudsburg, Pennsylvania.)

Check 4098 opposite last page.



now
handling
all
these
difficult
liquids

the meter with
NO flow
restrictions

Foxboro's first Magnetic Flow Meter went "on stream" in 1954. Today, this new-type meter has gained industry-wide application for precise, linear measurement of corrosive, viscous and other difficult process liquids.

The Magnetic Flow Meter is installed as simply as a length of pipe, with no straight runs required. It connects by standard electric cable to remote Foxboro Dynalog* Electronic Recorder. Overall accuracy of the system is $\pm 1\%$. And the meter even measures reversing flows.

With easy-to-measure liquids, or with tough ones like those listed below, the performance-proved Foxboro Magnetic Flow Meter provides flow measurement with no line restrictions. For complete details, write today for Bulletin 20-14C. The Foxboro Company, 813 Neponset Ave., Foxboro, Mass.

*Reg. U.S. Pat. Off.

CHEMICALS

hydrochloric acid
ammonium nitrate solution
phosphate slurry
rayon viscose
magnesium carbonate slurry
phosphoric acid
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starch solution

rubber copolymer
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sulphuric acid
70% sodium hydroxide
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FOOD

beer
grape juice
apple juice
pineapple juice
tomato juice
milk
starch slurry
sugar syrup
coffee slurry
molasses

aluminate liquor
uranium ore slurry
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acid wastes

OIL INDUSTRIES

drilling mud
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PULP & PAPER

all types of pulp stock
cooking liquors
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bleaching chemicals
lime mud slurries
sizes
alum
dyes

WATER & SEWAGE

activated sludge
fresh water
raw sewage
digested sludge
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return activated sludge

METER SIZES RANGE FROM 1/10 INCH TO OVER 6 FEET PIPE DIAMETER

FOXBORO
REG. U.S. PAT. OFF.

**MAGNETIC
FLOW
METERS**

Check 4099 opposite last page

Webster

SERIES 156 IDLERS

BALL BEARING TYPE MEDIUM DUTY



Designed —

to give long, trouble-free service under normal operating conditions — at distinct savings in cost.

Check these QUALITY FEATURES—

- One-piece, all-steel, welded frame with self-cleaning base; accurately and sturdily constructed.
- Balanced, tubular steel, heavy gauge rolls with heavy cast ends which keep bearings in perfect alignment.
- Precision-type ball bearings are fully enclosed, protected and permanently lubricated.
- Double bearing seals keep grease in and dirt out.
- Interchangeable roller assemblies locked in place by clips and cotters.
- Slotted locating collars are set-screwed to heavy, fixed steel shaft; prevents excessive movement of roll assembly and serves as an additional bearing seal.
- In stock—troughers and returns for belt widths from 18" to 36" inclusive.
- Idlers can also be furnished with 35 and 45 degree concentrators.

Write for literature.

WEBSTER MANUFACTURING, INC.
Dept. C-39, Tiffin, Ohio

Offices in All Principal Cities



Check 4100 opposite last page

NEW SOLUTIONS

Air-supported building protects rail tank cars from winter

Heated shelter keeps process lines humming

Problem: Lack of indoor docking facilities prevents winter storage for any length of time of railroad tank cars containing cold-susceptible chemicals at Du Pont's Montague, Mich., works.

When chemicals become too cold, they pose threat of production slow-ups and lost time for employees. Heavy snow (96.4" fell at Montague last winter) and temperatures considerably below zero work hardships on men and create safety hazards.

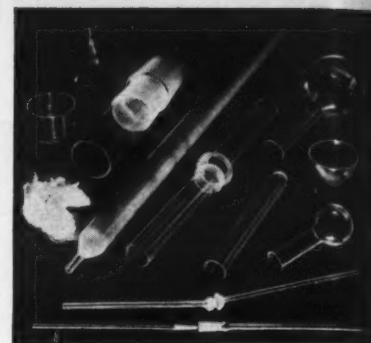
Solution: Air-supported building of neoprene-coated nylon, 58' in diameter, was erected last year over three 8089-gal tank cars set on strip of track. Heat is supplied by two 200,000 Btu heating coils in fan boxes, with input designed to maintain 40°F temperature inside shelter. Outside, mercury sometimes registers -20°F.

Shelter is made of eight-ounce nylon fabric coated on both sides with neoprene synthetic rubber. It is kept erect by maintaining small amount of air pressure within unit, and is kept inflated by static air pressure of 5/8" water furnished by two 2000 cfm blowers. Building is designed to withstand winds up to 75 mph when both blowers are operating.

Results: Heat pumped into shelter prevented tanks' contents from freezing last year, enabling chemicals to be pumped directly into process lines. Potential downtime and production slow-ups were eliminated, as were hazards to workmen. Coated fabric withstood snow, sleet and extremely low temperatures so well that building is being used again this year.

(Air supported building designed and fabricated by Irving Air Chute Company, 1315 Versailles Rd., Lexington, Kentucky.)

Check 4101 opposite last page.



For Highest Purity: GENERAL ELECTRIC FUSED QUARTZ COMPONENTS

EXCELLENT CHEMICAL PROPERTIES

General Electric Fused Quartz Components are made by the fusion of very inactive natural crystals, or specially treated silica sand, to assure a completely dependable material, essentially free of contamination. And they're available in a wide range of stock items*.

G-E Fused Quartz is attacked, but very slowly, by alkalis at room temperature—but not by hydrochloric, nitric or sulfuric acid at any temperature. Hydrofluoric acid will, of course, dissolve it at any temperature—as will phosphoric acid above 150°.

Almost complete freedom from impurities...and high temperature stability...make this an ideal crucible material when purity of the melt is critical. (G-E Fused Quartz Tubing and Rod are amazingly resistant to high temperatures and thermal shock, and are available in a wide range of sizes.)

BOOKLET AVAILABLE. For full technical information, write for the publication, "G-E Fused Quartz". It's free, no obligation. General Electric Co., Willoughby Quartz Plant, Dept. CP-39, Willoughby, Ohio.

*G-E FUSED QUARTZ STOCK ITEMS READY FOR IMMEDIATE DELIVERY

Standard Taper Joints	
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Beakers	Crucibles
Flasks	Test Tubes
Evaporating Dishes	

Progress Is Our Most Important Product

GENERAL ELECTRIC

Check 4102 opposite last page

CHEMICAL PROCESSING



Cycloidal blowers in vacuum service at St. Regis Paper

Furnishing 39,150 cfm of air at 20" Hg vacuum to couch of new Seminole Chief paper machine, and equipped with water-flow meters . . .

Blowers use over one million gallons less sealing water per day

GORDON WEYERMULLER, Associate Editor

Eight cycloidal blowers used for vacuum service on the new Seminole Chief paper machine of St. Regis Paper Company are equipped with a seal-water flow meter. This gives accurate control of amount of seal water fed to pumps so water consumption is kept at a minimum. Over one million gallons of sealing water per

day is saved through the use of this procedure compared to conventional units.

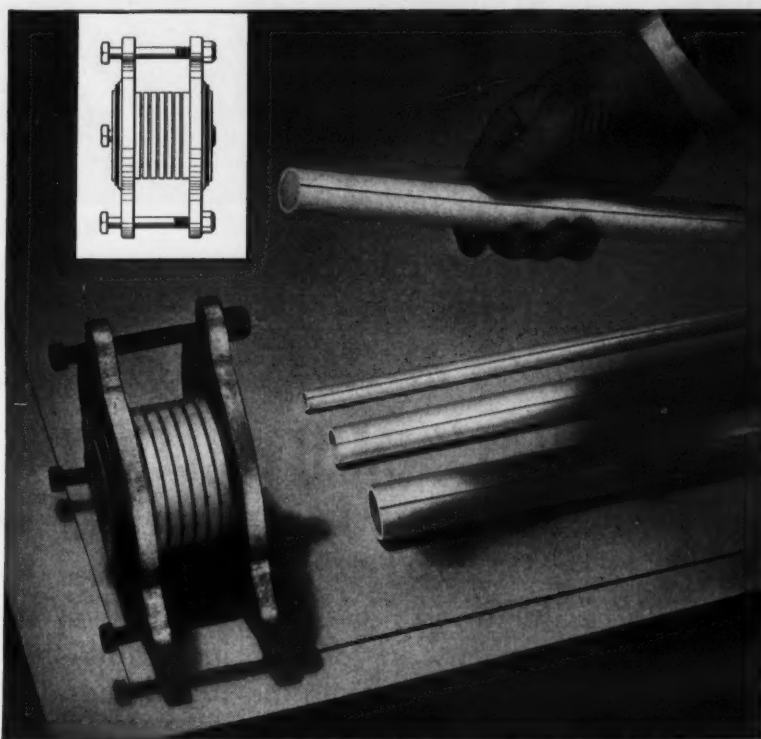
Three of the blowers supply 39,150 cfm of air to the couch at 20" Hg vacuum. As far as is known, this is the largest flow of air applied to a couch in any paper mill. Accompanying table gives data on this application and others

Operating Data on Blowers at St. Regis Paper

Applications	Size	CFM	Vacuum, Inches Hg	Speed RPM	HP
Wire Boxes	18 x 42 RCV	7600	10	585	184
Couch	3 - 22 x 55 RCV-2		20	514	1470
	18 x 42				
1st Press	1 - 18 x 42 RCV-2	7680	20	600	292
	16 x 27				
2nd Press	16 x 36 RCV	6280	15	720	233
3rd Press	16 x 36 RCV	6280	15	720	233
Vickery Felt Cond.	12 x 20 RCV	2360	14	875	84
Totals		69,350			2496

TEFLON* NEWS FROM R/M

- New expansion joint
- Color-striped thin-wall tubing
- Larger sheet sizes



New expansion joint and color striping on thin-wall tubing are part of R/M's comprehensive line of tubes, rods, sheets, tape and bondable "Teflon."

Raybestos-Manhattan announces three important additions to the broadest array of "Teflon" products available to the chemical industry: a new "Teflon" expansion joint featuring square convolutions for additional strength in flexure; "Teflon" thin-wall tubing with color striping to permit ready identification of individual tubes, and 1/32-in.-thick "Teflon" in new 36 x 36 in. sheets. Other thicknesses available in

sheets up to 48 x 48 in.

R/M also offers ample facilities for extruding, molding and machining "Teflon" to your exact specifications. In fact, whenever you look to "Teflon" to solve a problem, depend upon R/M to meet your needs. Consult your nearest R/M district office for courteous, competent assistance. For literature, write Plastic Products Division, Manheim, Pa.

*A Du Pont trademark



RAYBESTOS-MANHATTAN, INC.

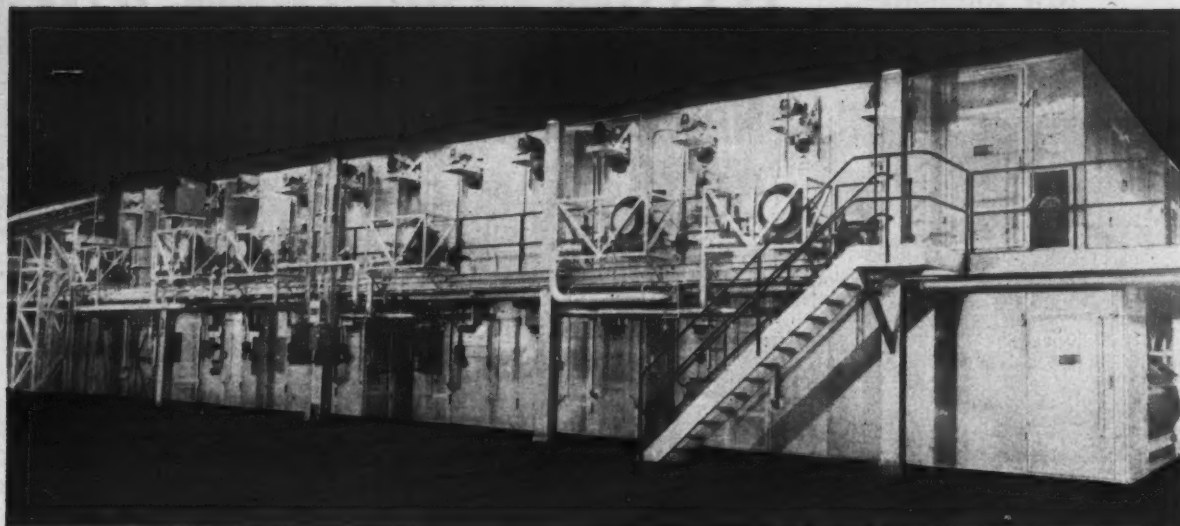
PLASTIC PRODUCTS DIVISION FACTORIES: MANHEIM, PA.; PARAMOUNT, CALIF.

Contact your nearest R/M district office listed below for more information or write to Plastic Products Division, Raybestos-Manhattan, Inc., Manheim, Pa.

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PITTSBURGH 22 • SAN FRANCISCO 5 • SEATTLE 4 • PETERBOROUGH, ONTARIO, CANADA

RAYBESTOS-MANHATTAN, INC., Engineered Plastics • Asbestos Textiles • Mechanical Packings • Industrial Rubber
Sintered Metal Products • Rubber Covered Equipment • Abrasive and Diamond Wheels • Brake Linings
Brake Blocks • Clutch Facings • Laundry Pads and Covers • Industrial Adhesives • Bowling Balls

Check 4103 opposite last page



THE GENERAL TIRE & RUBBER COMPANY *Has Recently Installed a Third* **"NATIONAL" MULTIPLE CONVEYOR DRYER** FOR SYNTHETIC RUBBER CRUMB

Successful operation of the first, then the second of these large, high-speed dryers inevitably resulted in this third "NATIONAL" installation as demand for the company's product increased.

Through unique principles of design and construction, and exclusive features of operation and control, these "National" dryers provide greatly accelerated production and consistently high uniformity in the drying of this difficult-to-handle material.

Write for Literature Describing these Modern Dryers

THE "NATIONAL" DRYING MACHINERY COMPANY
LEHIGH AVE. and HANCOCK ST., PHILADELPHIA 33, PA.

New England Agent: JONES & HUNT, INC., Gloucester, Mass.
Cable Address: "NADRYMA"—W. U Code

Check 4104 opposite last page

NEW SOLUTIONS

in the St. Regis Paper mill.

The new Seminole Chief paper machine serviced by blowers is used to produce kraftboard. Machine has a 276" wire and is designed to run at speeds up to 2500 fpm.

Suction couch, first press, second press, and third press blowers are all direct connected to and driven by synchronous motors. Wire box and Vickery felt conditioner blowers are direct connected to and driven by induction motors.

Principle of blower operation is simple and effective. Twin impellers, mounted on parallel shafts within a housing, are rotated in opposite directions by a pair of timing gears. Each impeller alternately sucks in, momentarily entraps, and then expels a definitely measured amount of air and vapor. This results in the evacuation of four equal, predetermined volumes with each complete revolution of main drive shaft. Suction is automatically built up to overcome resistance on inlet or vacuum side, and this continuous action results in a steady vacuum.

A minute clearance between the two impellers, and between impellers and casing, eliminates internal friction and wear. These clearances are effectively sealed by water introduced into pump, giving high volumetric efficiency. This sealing water serves to cool the pump by removing heat of compression. Higher operating speeds than on old-style pumps result in lower power consumption, higher efficiencies, and smaller floor space requirements.

(R-C cycloidal blowers for vacuum service are product of Roots-Connersville Blower, One of the Dresser Industries Inc., 900 Mount St., Connersville, Ind.)

Check 4105 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

NEW SOLUTIONS

Service of hot acid line increased over 30 fold using acid hose . . .

Transfer line withstands
weather, vibration

Problem: Maintenance-free service life of line carrying hot pickling acid at Acme Steel was averaging approximately one month. Two types of piping had been tried, one metallic and one non-metallic. Neither remained in service more than a month before leaking occurred. Eventually entire line had to be replaced.



Hose carrying hot acid is exposed to corrosive fumes and extremes in weather

Line is used to transport sulfuric acid from continuous pickling tanks more than 800 ft to batch pickling tanks over an intervening building. This building contains overhead cranes which cause considerable vibration of entire structure. Vibration caused quick failure of metallic pipe. Acid at 120 to 160°F in concentrations from seven to ten percent, acted on non-metallic piping which became brittle and was also cracked by building vibration.

Line was located out-of-doors subject to all weather conditions and corrosive fumes from pickling operations.

Solution: When entire line needed replacing again in 1952, Acme installed standard 2" acid hose. Sections of hose 50 ft in length were fastened together by Carpenter 20 stainless steel couplings. Hose consists of inside tube of smooth rubber 3/16" thick, covered by reinforcement of several plies of medium weight, square-woven fabric, and an outside rubber cover. Maximum working pressure is 100 psi. Low liquid absorption qualities of rubber protect fabric reinforcement from acid penetration and resist weather deterioration.

Results: Despite vibration,

YOU
never
saw
a
metering pump

like this!



NEW streamlined safety shield. **NEW** crank-type design. **NEW** improved accuracy. **NEW** parts interchangeability. **NEW** operational efficiency. **NEW** maintenance ease . . .

all at a new lower price!

Meet Hills-McCanna Masterline . . . four metering pump models developed to bring increased economy and accuracy to metering and proportioning! Tested and proved capable of registering new highs in performance and dependability. Hills-McCanna Masterline pumps handle payloads from a fraction of a gallon to 1030 gph per feed . . . and are designed all new *inside and out* to do it better than ever. For new maintenance ease and the best pump investment, investigate Masterline pumps *now* for your chemical proportioning, water treatment, petroleum addition and other similar needs!



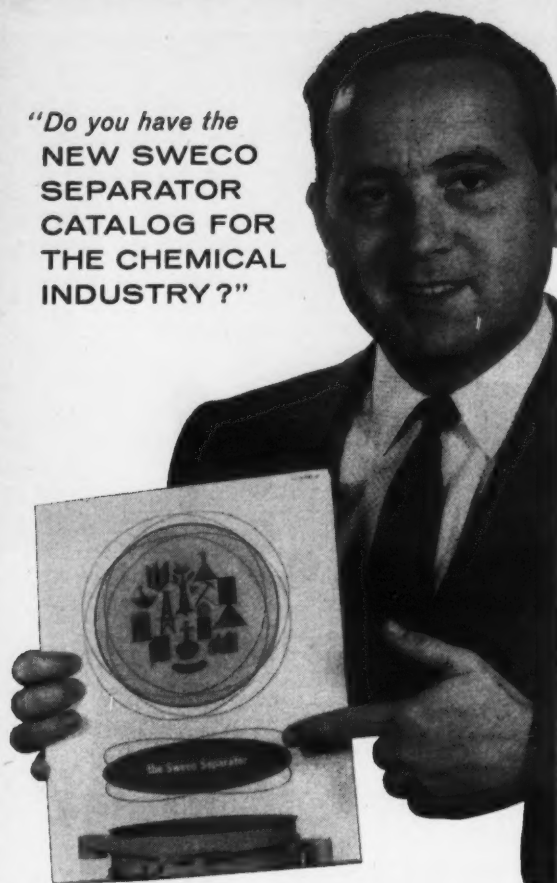
Write for informative new booklet! Just published, this new booklet gives all the details on Hills-McCanna Masterline Metering Pumps . . . pinpoints the features and elements that make Masterline pumps tops—for now and the future. Ask for Bulletin #900 "Look What's New in Metering Pumps." Hills-McCanna Co., 4371 W. Touhy Avenue, Chicago 46, Illinois.

*hills-
mc canna
company*

THE PEOPLE WHO KNOW AND CONTROL FLOW

Check 4106 opposite last page

"Do you have the
NEW SWECO
SEPARATOR
CATALOG FOR
THE CHEMICAL
INDUSTRY?"



It tells how SWECO Vibrating Screen Separators save time and money in screening products like potash, salt, vinyl pellets, detergents, calcium hydroxide, catalysts, zirconium oxide, activated carbons, and other chemical products. Over 550 Sweco units are now in use in the chemical processing field.

Gives Specs and Screening Data

It shows pictures and describes 22 different models—including 18", 30" and 48" diameter units for high capacity and continuous operation. Also gives case studies and details about Sweco's application engineering and demonstration services.

Write for your copy today!

Department S-303-3

Southwestern Engineering Company
4800 Santa Fe Avenue, Los Angeles 58, California
Engineers and Constructors... Manufacturers

Please send _____ new SWECO Separator Catalogs to:

NAME _____
COMPANY _____ TITLE _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____



Check 4107 opposite last page

NEW SOLUTIONS

extremes in weather, corrosive fumes, and constant handling of hot acid, hose has served continuously since installation in 1952 without a failure.

(Acid hose is a product of Industrial Products Div., B. F. Goodrich Co., 500 S. Main St., Akron 18, Ohio.)

Check 4108 opposite last page.

Conveyor halves time needed for unloading cars of bulk starch

Problem: Unloading bulk starch from hopper-bottom cars was time-consuming, costly, back-breaking work involving considerable guesswork. Continuous rodding was necessary to unload cars at the Pulp Division of Weyerhaeuser Timber Company, Springfield, Ore., and the work constituted a potential threat to safety of unloaders.

Solution: Pneumatic conveying and storage system was installed. It unloads bulk starch from Airslide cars, moves it to bulk storage, and then to cooking vats in weighed quantities.

Negative pressure unloads Airslide cars and delivers starch into glass-lined storage bins. Positive pressure actuates cars and conveys starch from bin unloader to scale hopper.

Results: With an average of one 50-ton car being unloaded per week, unloading time—including hookup, changing hoppers, etc.—is only about half of what was previously required. Now it takes just seven or eight hours, with actual unloading rate set at 10 tons per hour.

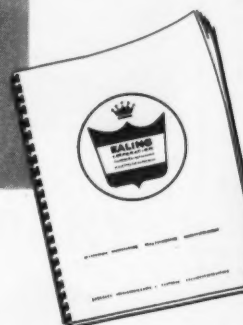
Pushbuttons and automatic controls have replaced guesswork formerly associated with operation. Rodding has been eliminated, unloading costs are lower, contamination has been removed, working conditions are cleaner and safer.

(Pneumatic conveying and storage system was designed and engineered by Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa.)

Check 4109 opposite last page.

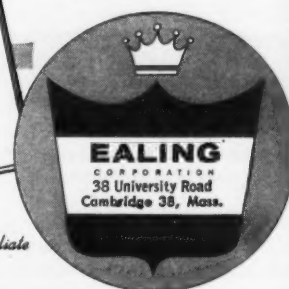
measuring microscopes cathetometers optical benches

COMPLETE specifications and illustrations are provided in this new 28-page catalog of precision scientific instruments.



a BAIRD-ATOMIC affiliate

Send us a note on your company letterhead and your Ealing Catalog will be put in the mail.



Check 4110 opposite last page



Ventilate CONFINED Places with Vano Design "C" Ventilator-Exhauster

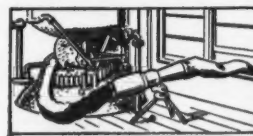
Ideal for withdrawing welding fumes from confined places or directly from the welding rod. Provides greater safety, greater comfort for workers... leads to greater work efficiency. Can be furnished with 8" suction inlet to which 8" non-collapsible suction tubing may be attached... or provided with multiple inlet nozzles for 5", 4" and 3" suction hose.

Other types are also available for supplying fresh air to men working in confined places, such as tanks, manholes, drums, boilers and ship-holds.

Coppus Engineering Corporation
383 Park Avenue
Worcester 2, Mass.



WELDING FUMES are here removed by this Vano Ventilator-Exhauster.



FUMES FROM A REACTOR KETTLE are here withdrawn by tripod-mounted Vano Ventilator-Exhauster. Note non-collapsible suction tubing and discharge tubing.



Check 4111 opposite last page

CHEMICAL PROCESSING



CHEMICAL MATERIALS

Typical Formulations

Formulation	Homopolymer	Polycarboxylic Acids	Anhydrides	Amines	Polyhydric Phenols
Epoxide 201	92% (by weight) 8% BF ₃ -Piperidine	1.0 (mol ratio) 0.5 Adipic Acid	1.0 (mol ratio) 0.9 Phthalic Anhydride	1.0 (mol ratio) 0.56 Diethylene Triamine	1.0 (mol ratio) 0.6 Bisphenol A
Curing					
Gel temp, °F	248	248	248	248	284
Gel time, min	4	5-10	240	40	300
Post cure	6 hr @ 320°F	2 hr @ 320°F plus 4 hr @ 355°F	4 hr @ 248°F plus 6 hr @ 320°F plus 4 hr @ 392°F	4 hr @ 248°F plus 6 hr @ 320°F	20 hr @ 356°F
Properties					
Heat-distortion pt, °F	337	203	464	219	257
Barcol hardness	49	23	-----	38	40
Izod impact strength	-----	0.4	0.3	0.5	0.2

Despite tremendous growth of epoxy markets, almost all formulations are based on epichlorohydrin and bisphenol A. This conventional system has limitations, particularly in regard to thermal and ultraviolet-light resistance and handling. A class of products recently made available may provide a . . .

NEW LOOK FOR EPOXY PLASTICS — WITH DIEPOXIDES

Uses: Diepoxides can serve as basic ingredients for epoxy resin systems or as modifying components. Applications include coatings, laminations, casting, and encapsulating.

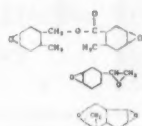
Features: Since epoxy resins first went into true commercial production a little over six years ago, they have achieved a 40-million-pound/yr market based almost exclusively (about 95%) on products prepared from reaction of epichlorohydrin and bisphenol A. Diepoxides, with a variety of molecular weights, exceed the limitations of this conventional system.

For casting and electrical encapsulation, diepoxide formulations provide lower viscosity for higher filler loading and prevent bubbles and voids. In glass-fiber laminating, formulations have low viscosity required for penetration of resin between fibers. Since this is done without addition of a reactive diluent, high-temperature laminants can be obtained easily.

Since these products do not contain phenolic rings associated with almost all commercially available epoxy resins, coatings can be made which are virtually unaffected by ultraviolet light. For all applications, initial color is low and resistance to thermal degradation and air oxidation is improved.

Lower equivalent weight and shorter distance between reactive groups means epoxy plastics from diepoxides are more highly crosslinked or thermosetting in nature. Thus, with many of same hardeners used for traditional epoxies, plastics with higher heat distortion temperatures are obtained.

Description: Three diepoxides now available in development quantities but soon to be commercially produced are:



- 1) 3,4-Epoxy-6-methylcyclohexylmethyl-3,4-epoxy-6-methylcyclohexanecarboxylate (Epoxide-201);
- 2) 1-Epoxyethyl-3,4-epoxycyclohexane (vinylcyclohexene dioxide);
- 3) Dicyclopentadiene dioxide.

Physical Properties

	Epoxide 201	Dicyclopentadiene Dioxide	Vinylcyclohexene Dioxide
Mol weight	280.35	164.21	140.18
Density, g/ml @ 25°C	-----	1.331	-----
Sp gr, 20/20°C	1.121	-----	1.0986
BP, °C	215 (@ 5 mm Hg)	-----	227 (@ 1 atm)
MP, °C	-----	184	-----
Viscosity, cps	1810 (@ 25°C)	-----	7.77 (@ 20°C)

Of these, most experimental work has been done with **Epoxide 201**. Product is a liquid with a molecular weight of 280.35 and a viscosity of 1810 cps at 25°C. It has been used to prepare a number of typical formulations (see table) which can be tailored to meet particular need for a given application.

Vinylcyclohexene dioxide can be polymerized alone to

a three-dimensional resin and can also form condensation resins with dicarboxylic acids. It can also be used as a monomer for preparation of polyglycols containing unreacted epoxy groups. Resin formulations using conventional epoxies can be reduced in viscosity without lowering heat-distortion temperature by addition of vinylcyclohexene dioxide (10% reduces resin viscosity from 19,500 cps to 4300 cps at 20°C). This diepoxide has a molecular weight of 140.18 and a viscosity of 7.77 cps at 20°C.

Dicyclopentadiene dioxide

Dibutyl Sebacate

Outstandingly Efficient
Plasticizer
odorless • tasteless • colorless

for use with
Vinyls
Cellulose
Synthetic
Rubbers
Polymers

to prepare
Films and Sheet
Extruded Products
Solutions
Plastisols and
Organosols
Molded Products

Outstanding Performance Rating

- Excellent low temperature properties
- F.D.A. accepted
- Excellent ease of incorporation
- Very good heat blocking resistance
- Very good lubricity
- Low rate of extraction



Ask for information about other Plasticizers available for specific applications.

The C.P. Hall Co.
CHEMICAL MANUFACTURERS

5245 W. 73rd St., Chicago 38, Illinois
NEWARK • AKRON • CHICAGO
MEMPHIS • LOS ANGELES

Check 4112 opposite last page

CHEMICAL MATERIALS

(molecular weight 164.21) is a crystalline solid diepoxide with a melting point of 184°C. Formulations are liquid and have pot lives of more than a week at room temperature. Highly compact structure makes possible epoxy plastics with outstanding high-temperature properties. Its low combining weight is an advantage when used to cross link or modify low-cost resins and polymers.

Diepoxides are currently available in up to 55-gal drum quantities for evaluation. Production capacity for multi-million-pound quantities is planned.

(Epoxide 201, dicyclopentadiene dioxide, and vinylcyclohexene dioxide are products of Union Carbide Chemicals Co., Div. of Union Carbide Corp., 30 E. 42nd St., New York 17, N.Y.)

Check 4113 opposite last page.

Soaking, mixing time cut for cold-water soluble casein products

Uses: Products are designed for paper coatings, paints, inks, adhesives, leather and textile finishing, wax and asphalt emulsions, and as latex stabilizers and thickeners.

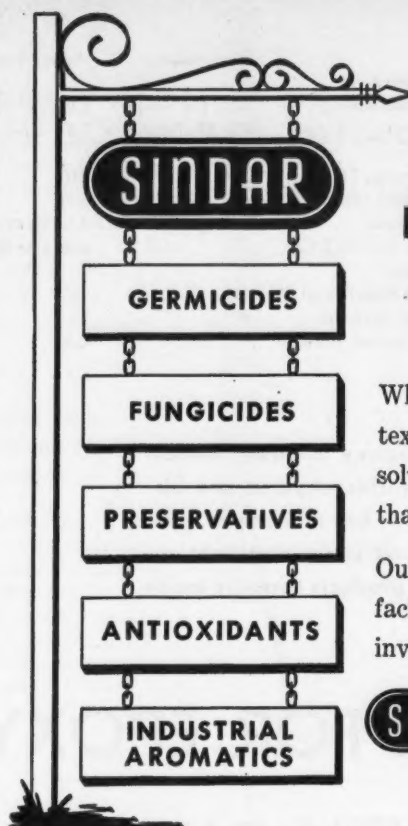
Features: Unlike most conventional caseins, products require only 10 minutes of alkali soaking and about 30 minutes of mixing at only 60 to 80°F temperatures.

Description: Products are shipped in 100-lb bags which may be stored safely for more than a year.

PV-424 has a very low ash and free acid content, low bacteria count, low alkali requirement, and high adhesive strength. Complete solutions can be obtained at pH 9.0 in 10 minutes at 60°F.

PV-428, a sodium caseinate, is soluble in cold water with no additional alkali required. Resulting solutions are of low pH at only 6.0.

PV-430 is low-foaming zinc casein. It requires addition of ammonium hydroxide to obtain complete solution. On drying, zinc casein film has



BRING YOUR PROBLEMS TO SINDAR!

Whether your line is soaps, paints, textiles, rubber, cosmetics, plastics, solvents...there's a Sindar product that can help you.

Our technical staff and laboratory facilities are at your service. We invite your inquiries.

SINDAR Corporation
Industrial Aromatics and Chemicals
321 West 44th Street
New York 36, N. Y.

Check 4114 opposite last page



Lasts Longer • Costs Less

Efficiency . . . economy . . . durability—three important standards—are yours in the AEROMASTER fan.

AEROMASTER fans are efficient because they embody advanced aerodynamic principles. True airfoil blade sections give maximum air delivery.

AEROMASTER fans are economical because adjustable pitch angle of the blade permits a flexibility of setting which enables you to decrease fan load to an

accurate minimum horse-power requirement. Design features reduce labor and installation costs.

AEROMASTER fans are durable because they are made from corrosion resisting, silicon-magnesium, aluminum alloys with high tensile strength, fine grain structure and increased endurance limit.

For more details write to KOPPERS COMPANY, INC., Aeromaster Fan Dept., 8303 Scott Street, Baltimore 3, Md.

*Koppers Trademark



Aeromaster Fans

Engineered Products Sold with Service

Check 4115 opposite last page

How to handle Fluorine Gas in the laboratory

very good water resistance. No additives are required. Solutions have high viscosity and small amounts give considerable thickening when added to a latex. Product has good keeping qualities. Solutions usually may be held two weeks without preservatives. Product does not swell in water.

PV-800, one of series of biologically stable caseins, is of very low viscosity. Cold-cut solutions require no preservatives and may be kept for months without spoilage. Solutions are obtained by using any of the standard alkalis. Preservative action is built directly into the casein molecule and does not migrate away. Cold-cut solutions prepared at 25% solids have viscosity of only 400 centipoises.

Product is an excellent pigment dispersant. It has little thickening effect on latex, but acts as a good protective colloid. It may be made water-resistant by using any of the standard procedures, such as treatment with formaldehyde or metallic salts. Tests indicate that it is not acutely toxic.

(Protovac cold-water soluble caseins are products of Casein Dept., Borden Chemical Company, 350 Madison Ave., New York 17, New York.)

Check 4116 opposite last page.

Yellow dye fast to light

Uses: Dye is applicable to raw stock, skeins, packages, piece goods, and hosiery.

Features: Product has high degree of fastness to light (even in pale shades), perspiration, crocking, washing, chlorine and peroxide bleaching, dry cleaning, hot pressing, water spotting, and continuous scouring.

Description: Bright greenish-yellow, homogeneous vat dye was developed to produce level dyeings and withstand mill processing. Manufactured with controlled particle size.

(Calcoid Fast Yellow 6GL Single Paste is a product of Pigments Division, American Cyanamid Company, 30 Rockefeller Plaza, New York, N.Y.)

Check 4117 opposite last page.

Your laboratory research work with fluorine can be comparatively simple, safe and convenient. Two requirements have to be met, and General Chemical helps you meet them both! You need a ready source of fluorine. And you need basic information that will help you build a fluorine handling system offering maximum safety and convenience.

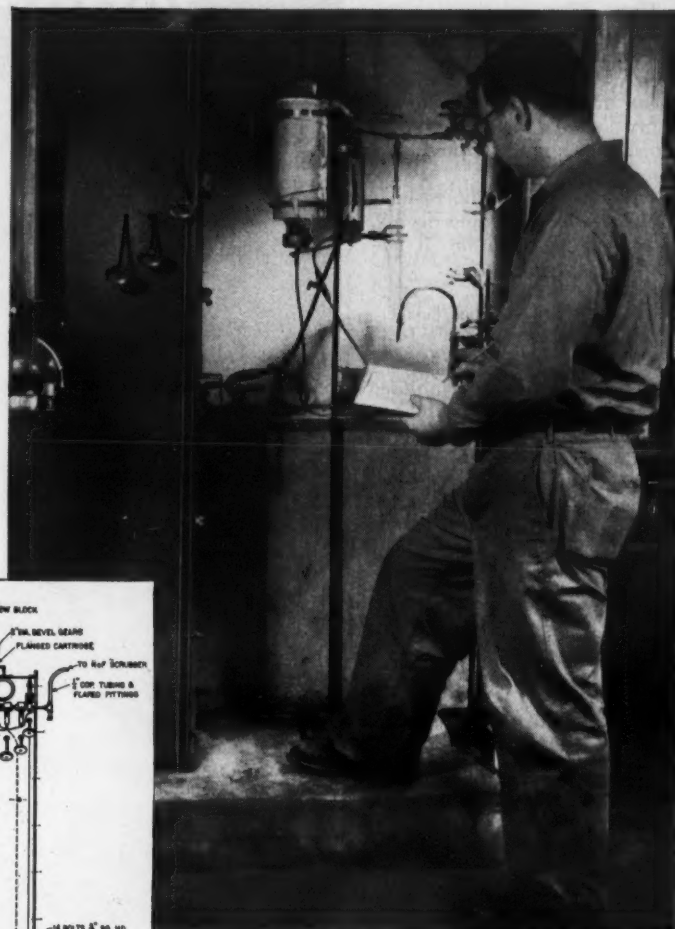
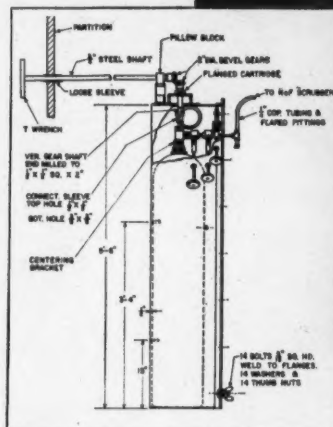
Why "make" when you can buy! There's no need to become involved in the labor, expense and hazard of making your own fluorine when fluorine gas in cylinders is readily available from General Chemical. All you have to do is pick up the phone!

A safer, more convenient handling system. As the leading producer of fluorine, with a natural interest in seeing that fluorine handling is simplified and made safer, we have developed a fluorine handling system for the laboratory. Designed specifically for standard fluorine cylinders of six-pound net weight, this fluorine handling system is easy to construct . . . convenient to use . . . delivers clean, measured volumes of gaseous fluorine at minimum risk. The system has been used by General Chemical for a number of years. We will be glad to send you the information you need to build this handling train in your own laboratory.

Mail coupon for data sheet. We've just prepared a data sheet on this suggested fluorine handling train, including schematic diagrams and directions. We'd like to send you a copy. Just mail the coupon.



GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.



Heart of the fluorine handling system is the all-welded steel safety enclosure illustrated in cross-section here. The enclosure vents through a 4-inch duct into the laboratory exhaust system . . . is connected with a nitrogen cylinder for instant purging.



Baker & Adamson® Products
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL CORPORATION
40 Rector Street, New York 6, N. Y.

Please send copy of product data sheet PD-TA-85413A, "Handling Elemental Fluorine Gas in the Laboratory."

Name _____
Title _____
Company _____
Address _____
City _____ Zone _____ State _____

CP-39

Check 4118 opposite last page

**Acrylic resin solution
has good adhesion
to many surfaces**

Uses: For plastic, metal, wood, and fabric coatings.

Features: Solution adheres well to many different surfaces. It also has good durability under extremes of sunshine, humidity, and low temperature.

Description: Acrylic resin is a clear, colorless, rapid drying, hard polymer solution. It ad-

Physical Constants

Solids	30% \pm 0.5%
Solvents	90/10:Toluol/Butanol
Viscosity (as is)	N-U
(Gardner-Holdt at 25°C)	

heres firmly when formulated as either an air-drying or baking top coat on bare metal or commercial primer for automobiles and appliances. Resistance to road tar stains or gasoline is excellent.

(Acryloid A-21 is available from Resinous Products Div., Rohm & Haas Company, Washington Square, Philadelphia, Pennsylvania.)

Check 4119 opposite last page.

**Epoxy novolac has
heat resistance,
stability**

**Chemical resistance greater
than in conventional resins**

Uses: In high-strength adhesives for metal fabricating, glass-reinforced laminates for structural shapes, and electrical-printed circuits.

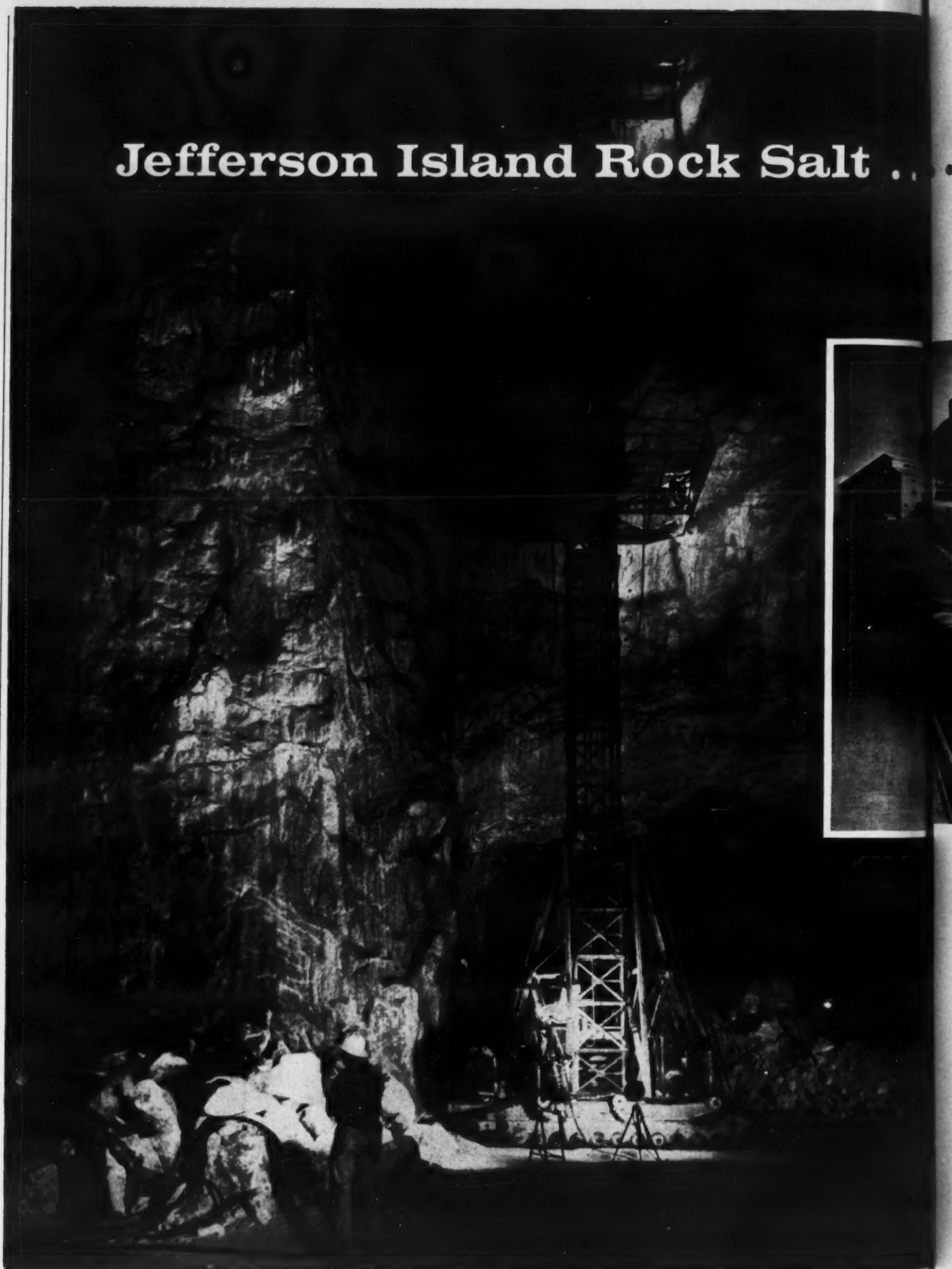
Features: Resin has heat stability and strength at high temperatures. Chemical resistance properties are good.

Description: Resin is an epoxy novolac, differing from conventional resins in that it is based on epichlorohydrin and novolac instead of on epichlorohydrin and bisphenol-A. Resin is available in 85% solids solution to facilitate handling by fabricators.

(X-2638.3 epoxy resin is a product of Plastics Division, The Dow Chemical Company, 1000 Main Street, Midland, Mich.)

Check 4120 opposite last page.

Jefferson Island Rock Salt ..



so pure that every chemical manufacturer benefits



The picture above shows rock salt being loaded into barges at Jefferson Island, La., for movement through the Inland Waterways. Many chlorine, synthetic rubber and other heavy industrial plants use barging to effect both economy and service.

For many years, rock salt from Jefferson Island has made possible many economies in chemical processing.

Mined in Louisiana from one of the world's purest deposits, this rock salt results in a consistently better end product—without the costly side reactions of impurities found in less pure salt. The big story is up to 99% purity at the source.

TWO GREAT NAMES MERGE AS ONE

Recently, the Jefferson Island Salt Co., merged with Diamond Crystal, a company known for more than 70 years as a quality producer of flake and granular salt. For example, Diamond Crystal is the leading supplier of salt to high quality food processors.

Jefferson Island Division, on the other hand, is the largest supplier of industrial rock salt by barge on the inland waterways. In fact, they pioneered the first complete ocean-going barge movement of salt to Gulf Coast chemical plants.

INHERENT PURITY—KEY TO COST SAVINGS

The inherent purity in Diamond Crystal Salt is a major factor in *all* industries.

In addition, maximum customer economies and service can result from using Diamond Crystal's complete facilities.

For immediate service and consultation on your salt problem, call the nearest Sales Office or write: Jefferson Island Salt Div., Diamond Crystal Salt Co., St. Clair, Michigan.

DIAMOND CRYSTAL SALT

SALES OFFICES: CHARLOTTE, ATLANTA, NEW ORLEANS, LOUISVILLE, BOSTON, NEW YORK, AKRON, DETROIT, CHICAGO, MINNEAPOLIS
PLANTS: AKRON, OHIO . . . JEFFERSON ISLAND, LA. . . . ST. CLAIR, MICH.

Handling and dust hazards with borohydrides pelleted away

Powdered-form purity kept with pellet form

Uses: Continuous reduction of aldehydes and ketones and fixed-bed purification to remove carbonyl or peroxides from gaseous or liquid olefins, diolefins, alcohols and glycols, amines and amino alcohols, ethers and polyethers, and acrylonitrile and chlorinated hydrocarbons.

Features: Pelleted form simplifies handling and dust hazards. Product has some purity as powdered form.

Description: Sodium and potassium borohydride pellets are hard and resist crushing. Size ranges from 10/32 to 24/32" in diameter. Bulk density averages 5 lb/gal.

(Sodium and potassium borohydride pellets are products of Metal Hydrides Incorporated, Beverly, Mass.)

Check 4122 opposite last page.

Removes uncured resins effectively, safely —

Won't irritate skin

Uses: For cleaning equipment used in handling epoxy and polyester formulations.

Features: Fast-acting resin detergent converts uncured resin wastes to water-dispersible state. It is non-flammable

Typical Properties

Color	Light straw
Odor	Slight
Sp gr (25°/25°C)	1.02
Viscosity @ 25°C (cps)	30-40
Flash pt, open cup (°F)	190
Ignition temp, min (°C in air)	290

and non-toxic, and will not cause any irritation to the skin.

Description: Material is a solvent-based clean-up detergent for removal of uncured epoxy, polyester and similar resins.

(Isoterge 1405 is product of Isochem Resins Corporation, 221 Oak St., Providence 9, Rhode Island.)

Check 4123 opposite last page.

Check 4121 opposite last page

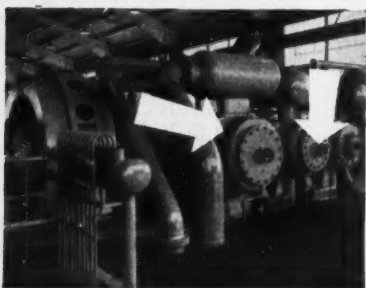


New 16-page booklet tells how...

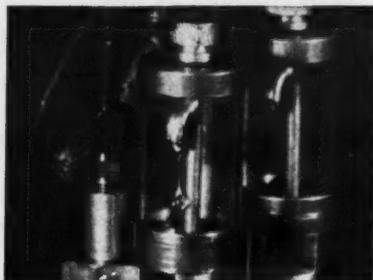
PYDRAUL AIR COMPRESSOR LUBRICANT GIVES 3 "MOST WANTED" BENEFITS AT LOWEST COST: LOW UPKEEP, PEAK LUBRICATION, FIRESAFETY



PYDRAUL AC RUNS CLEAN—can substantially cut compressor upkeep costs because it reduces build-up of carbon and other deposits—extends time between overhauls. Side-by-side photos (above) of an exhaust valve—used in the same industrial air compressor with only the lubricant changed—show how Pydraul keeps systems freer from harmful and dangerous deposits than a premium oil. Lower maintenance costs alone usually justify use of Pydraul.



FIRESAFE PYDRAUL AC GIVES protection 2 ways in this danger zone—guards these three 4,000-hp. compressors. Petroleum oil residues deposit inside cylinders, valves, piping—glow hot and flake off—can unpredictably ignite flammable vapors from hot petroleum-based lubricants, causing fire... explosion! Monsanto's synthetic lubricant, Pydraul AC, essentially eliminates this basic cause of most compressor fires and explosions: It lessens carbon deposits and oxidation residues, and it is *fire-resistant*.



PYDRAUL AC LUBRICATES like premium-grade oil—good anti-wear and noncorrosive features give equipment long life. And Pydraul is the one lubricant for virtually every compressor you own—has demonstrated excellent lubricating efficiency in hundreds of compressors of all sizes produced by all major manufacturers—gives trouble-free compressor operation for many years. Now, Pydraul is effectively lubricating compressors operating at over 4500 psi—many operating continually with exhaust air temperatures of 340°F.

PHOTO COURTESY GRACE CHEMICAL CO. PYDRAUL—MONSANTO T. M. DIV. OF W. R. GRACE & CO. REG. U. S. PAT. OFF.

Now, illustrated booklet gives more details, including how to make the easy conversion to Pydraul AC. Write, today. No salesman will call unless you so request.

Monsanto

FOR CONVENIENCE, USE QUICK REPLY COUPON

Monsanto Chemical Company
Organic Chemicals Division
Dept. CP-1, St. Louis 66, Mo.

Please send me the new 16-page booklet on fire-resistant Pydraul AC lubricant for air compressors.

Name _____

Company _____

Address _____

City _____

CHEMICAL MATERIALS

**Liquid fatty alcohol
is colorless,
odorless**

Oleyl alcohol is economical

Uses: Product can be used as wetting and dispersing agent in zinc oxide, titanium oxide, and pigments in general. In cosmetics it serves as an emollient, emulsion stabilizer, super-fattening agent, and pigment suspending agent.

Features: Oleyl alcohol is economical, odorless, and colorless.

Description: A high-vacuum process is utilized in production of oleyl alcohol. Product is miscible with fat, oil, and wax mixtures and will blend with oil phase of cosmetic emulsion. Physical properties are as follows:

Setting point	2-5°C
Iodine value	88-91
Acid value	0.025 max
Saponification value	0.10 max
Hydroxyl value	207-211
Viscosity	@ 70°F = 149
(Redwood units)	@ 100°F = 86
	@ 140°F = 52
Specific gravity	60°F/60°F = 0.851
C ₁₈ alcohols	94.8%
C ₁₆ alcohols	5.0%

Oleyl alcohol is non-hazardous material requiring no special handling precautions. It is supplied in 400-, 100-, or 25-lb aluminum drums.

(Novol cosmetic oleyl alcohol is a product of Croda Inc., 51 Madison Avenue, New York 10, New York.)

Check 4125 opposite last page.

Finishes BO bacteria on textile fabrics

Uses: For protecting against formation of body odors on fabrics.

Features: Said to be first durable protection of its type, finish kills both types of bacteria that cause characteristically unpleasant odor of perspiration.

Description: Initial garments are cotton and cotton blends, on which finish retained its effectiveness through as many as fifty washings. Finish is claimed to be equally as ef-



**INDUSTRIAL
CHEMICALS**

We mine Copper, Sulfur, Iron and Zinc and are basic producers of their chemical derivatives. Our technical know-how and basic position in these minerals is your assurance of exacting quality control, strict uniform consistency and a plentiful supply.

COPPER

COPPER SULFATE
MONOHYDRATED COPPER SULFATE
CUPRIC CHLORIDE
COPPER CARBONATE

SULFUR

SULFURIC ACID
LIQUID SULFUR DIOXIDE
SODIUM HYDROSULFATE
PARA TOLUENE SULFONIC ACID, ANHYDROUS
CHLOROSULFONIC ACID

IRON

FERRIC IRON SULFATE

ZINC

MONOHYDRATED ZINC SULFATE
ZINC OXIDE

MANGANESE

MANGANESE SULFATE
MANGANOUS OXIDE
MONOHYDRATED
MANGANESE SULFATE

Samples, specifications and detailed information upon request.



TENNESSEE CORPORATION
617-666 Grant Building, Atlanta, Ga.

Check 4124 opposite last page

Check 4126 opposite last page
CHEMICAL PROCESSING

B.F. Goodrich Chemical *raw materials*

fective on rayon, linen, and all cellulosic fibers and blends.

Finish is compatible with other types, and does not cause any change in hand or color. Manufacturers recommend laundering with an oxygen safety bleach.

(Information on odor-control finish may be obtained from Textile Chemicals Dept., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, New York.)

Check 4127 opposite last page.

Valve clogging stopped by resinous solutions in aerosol form

Uses: Product is suitable for diverse range of aerosol applications and other potential uses in conventional packaging.

Features: Non-flammable material provides low odor factor, and eliminates valve clogging and need of special valve treatment.

Description: Resinous solution is exceptionally fast drying and does not sag and run under ordinary application of even heavy coats. Laboratory and field tests indicate material is alcohol resistant, salt resistant, and acid resistant. Luster, film hardness, and resiliency can be controlled for special applications.

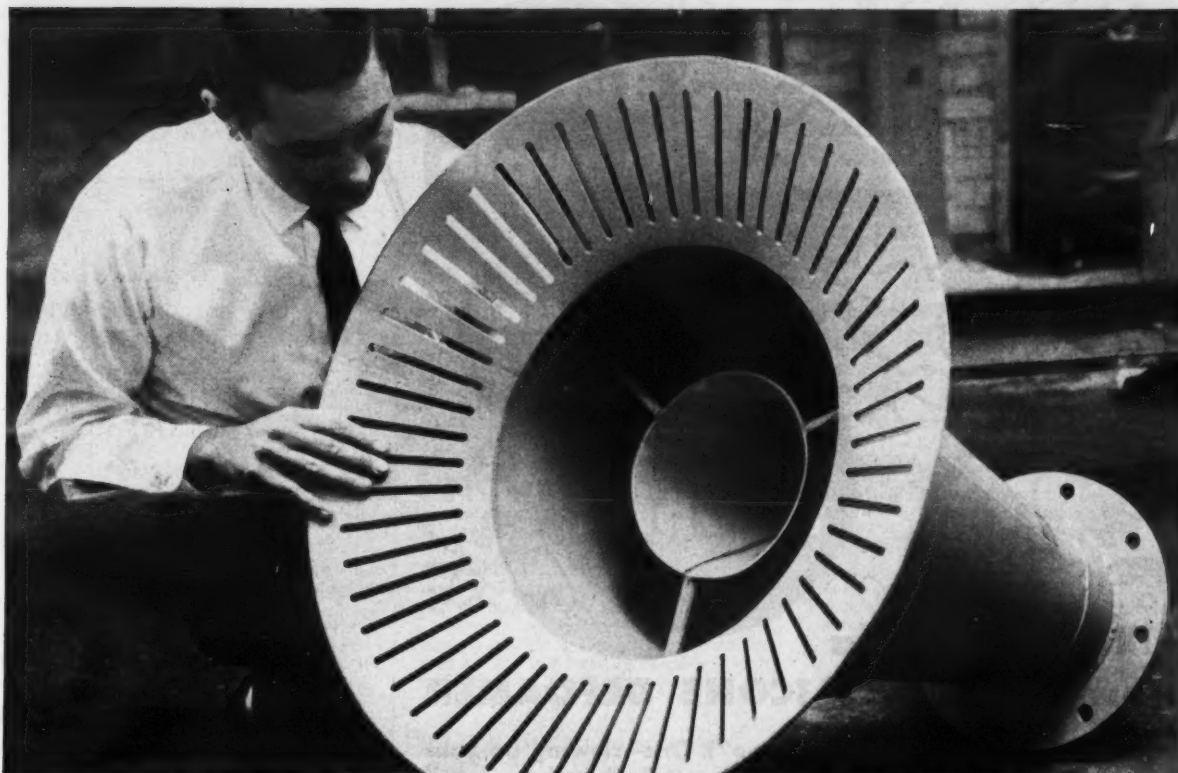
Product is available in one-gallon, five-gallon, and 55-gallon drums, either in clear or wide range of colors.

("Darasol" is development of Chlorinated Products Div., Diamond Alkali Co., 300 Union Commerce Building, Cleveland 14, Ohio.)

Check 4128 opposite last page.

Data book—useful in evaluating many chemical reactions has been revised by catalyst manufacturer. The 40-page book includes listings of enthalpies, heat capacities, equilibrium constants, steam tables, and other valuable data. "Physical and Thermodynamic Properties of Elements and Compounds" — Girdler Catalysts, Chemical Products Div., Chemetron Corp., P.O. Box 337, Louisville 1, Ky.

Check 4129 opposite last page.



Fume diffusers are fabricated by Electro-Chemical Products Company, Cleveland, Ohio, of sheets of rigid Geon made by Seiberling Rubber Company, Newcomerstown, Ohio. B.F. Goodrich Chemical Company supplies the Geon polyvinyl material only.

FUME DIFFUSERS TOOK A LICKING FROM CORROSION

... till the cones were made from GEON

THESE cones of Geon rigid vinyl show how you can solve corrosion problems. They are used to diffuse hydrofluoric and chromic acid fumes in a chemical plant, where cones of metal and other plastic were tried first.

Geon rigid vinyl solves corrosion problems—because it withstands acids, oils and many hydrocarbon chemicals. Geon also provides for accuracy in fabrication. For example, the sheet of rigid Geon from which these cones were made was machined to extremely close tolerance—.003 inches for the slots—to give the cones the exact design for most efficient

fume dispersion.

Products of versatile Geon polyvinyl materials can be made in rigid form, rotationally cast, slush molded, calendered, extruded or blown into foam form. Applications range from solving all types of corrosion problems from piping to ductwork, to coatings for paper, metal and other materials.

For information on Geon polyvinyl raw materials, write Dept. AL-1, B.F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

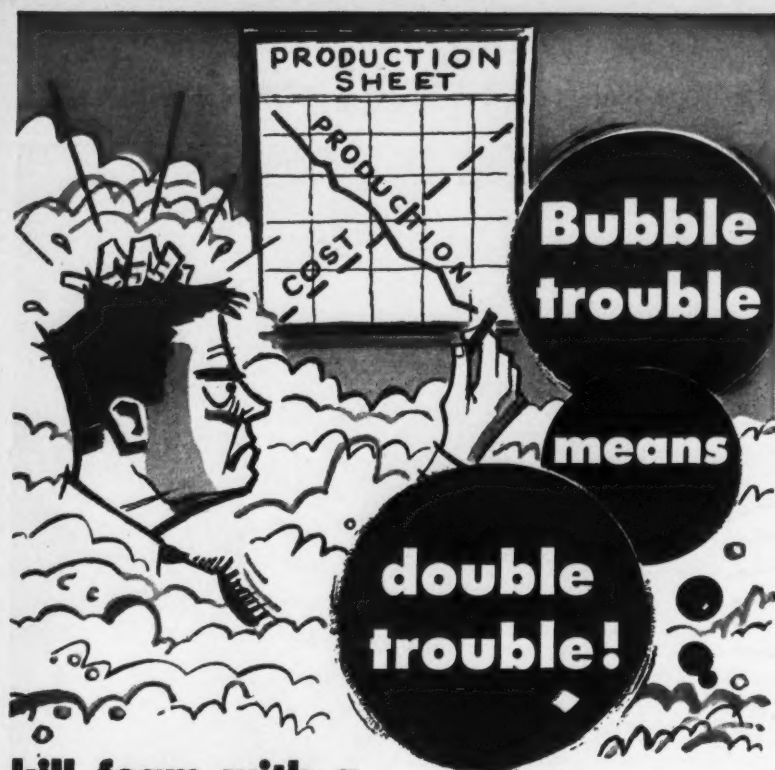


GEON polyvinyl materials • HYCAR rubber and latex
GOOD-RITE chemicals and plasticizers • HARMON colors



B.F. Goodrich Chemical Company
a division of The B.F. Goodrich Company

Check 4130 opposite last page



kill foam with a Dow Corning SILICONE DEFOAMER

Is foam giving you the old "one-two"? One—slowing up your processing . . . two—running up your costs? Fight back hard. Knock out foam fast, with Dow Corning silicone defoamers . . . most efficient foam killers known!

1 oz
kills foam in:

- 3,125,000 lb cellulose slurry
- 62,500 lb hypo fix and film developer
- 6,250 lb acetic acid-wood alcohol distillation mix

FREE SAMPLE! Make your own test. Return coupon below for generous trial sample of a Dow Corning SILICONE DEFOAMER. No obligation, of course.

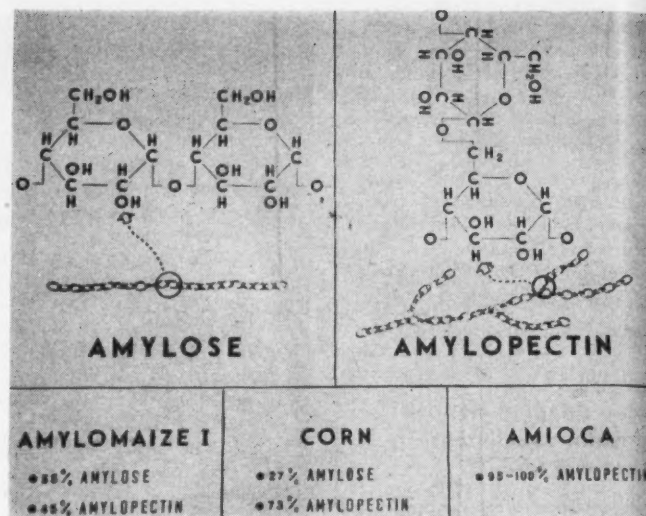


Dow Corning CORPORATION
MIDLAND, MICHIGAN

NAME _____ 3215		<i>My foamer is</i> Oil system _____ Aqueous system _____ Food products _____ Other _____
TITLE _____		
COMPANY _____		
CITY _____	ZONE _____ STATE _____	

Check 4131 opposite last page

CHEMICAL MATERIALS



"Back to nature" for a potentially low-cost packaging and coating raw material is the story unfolded recently by two leading corn processors. Now on the way to commercial availability is . . .

Film-forming corn starch for expanded industrial horizons

Application of genetics, imagination, and eight years of research has succeeded in producing a potentially low-cost, film-forming raw material from a high-amylose starch fraction of corn. Capable of reactions similar to cellulose, the product, now designated Amylomaize I, marks a scientific breakthrough of importance not only to manufacturers of packaging and coating products but to corn growers and the agricultural economics of the country as well.

Conventional corn starch contains two main fractions, amylose (27%) and amylopectin (73%). Amylopectin fraction consists of branched chains and has as an important characteristic the ability to thicken and bind. It is this ability that gives high-amylo-

pectin starch wide usefulness in adhesives, textiles, paper, food and pharmaceuticals, and chemical processing. Genetic breeding produced starch containing essentially 100% amylopectin as early as 1942.

Amylose is primarily a straight-chain molecule similar to cellulose. Although it has been available from corn starch fractionation, cost has been too high to enable users to utilize its potential properties.

Now, genetic breeding has produced Amylomaize I containing 55% or more of amylose. It is this starch that holds wide possibilities for further industrial application. Here are a few of its more outstanding properties:

1. Formation of grease-resistant films and coatings

Amylomaize 1 shows a high amylose content. Similarity of the straight-chain molecule in amylose to that of cellulose gives it film-forming properties at a potentially lower cost

Dr. James W. Evans (left), director of research, American Maize-Products Co., and Dr. C. G. Caldwell, director of research, National Starch Products, Inc., examine several ears of the special high-amylose corn



of high film strength.

2. Easily solubilized by heating under pressure; eliminating chemical solubilization required by cellulose.
3. Solutions can be made viscosity-stable for extended periods.
4. It readily forms esters, and ethers, and undergoes secondary bonding reactions with other polyhydric materials.

Economically, product could be a lower-cost film former than those of comparable strength now available. (Commercial corn starch is priced at about 7.5c/lb.) Being a food product, it is easily digested by body enzymes.

A Story of Cooperation

High-amylose corn is based on pioneering work started in 1950 by Bear Hybrid Corn Co. together with U.S. Department of Agriculture's Northern Regional Research Laboratory, Peoria, Illinois. Basic idea was outlined to American Maize-Products Co. and National Starch Products Inc. who financed actual plantings and initiated work on application and production research.

Although American Maize and National are essentially

BRIEFS

Wet or dry How do you like your KOH?

If you're one of the relatively few people who prefer caustic potash in the solid state, we can provide you with any of these seven forms, all at 90% KOH:

- | | |
|-------------|-----------|
| 1. Solid | 4. Walnut |
| 2. Flake | 5. Broken |
| 3. Granular | 6. Powder |
| 7. Crushed | |

If one of these won't do, we can ship you 85%-strength KOH of even higher purity, in flake or solid form.

If you prefer your caustic potash liquid (it's generally cheaper and easier to handle), you can get it from us in concentrations between 45% and 52%, delivered in 55-gallon drums, tank cars of 4,000-, 6,000-, 8,000-, or 10,000-gallon capacity—or in duplex tank cars holding 3,000 gallons per compartment.

Is all this fuss worth while over a specialty alkali like caustic potash?

Well, our customers tell us it is. And they buy, under the NIALK® label, about half the caustic potash sold in this country.

We hope you'll think so, too.

Sulfides in new drum easier to empty or re-use in your plant



Your operators will like the convenience of this new 400-lb. drum in which you can now purchase Hooker sodium sulfide and sodium sulfhydryte.

The opening is 18 inches in diameter

—four inches wider and 65% larger in area than the former container.

This drum is much easier to empty with a scoop or shovel. It saves time and is safer when pouring, too. Flakes don't pile up around the opening when drum is inverted.

You'll also like the way this drum safeguards the exceptionally low iron content of our sulfide or sulfhydryte until you're ready to use it.

Only brand-new drums are shipped; none are re-used. A lacquer lining prevents iron pickup during shipping and storage. Six lugs hold the lid on tight, and let you reseal the drum to protect any unused product.

There's no increase in price for the new drum. To get its extra convenience and safety, just specify Hooker sodium sulfide or sodium sulfhydryte on your next order.

99.8% pure oxalic acid

We make an oxalic acid that's about as pure as any you'll find outside a lab. We sell it under the brand name OLDBURY®.

A typical assay shows 99.8% purity. You can get this chemical in two pure-white crystal sizes—No. 2 fine and No. 3 fine.

Both are packed in 100-lb. and 300-lb. Leverpak containers.

Send for data sheet Keep your technical file up to date by adding to it a copy of our latest publication on Oldbury oxalic acid: Data Sheet 789.

This data sheet lists specifications, physical properties, packing data, and

on the many, many forms of NIALK® caustic potash... a new sulfide drum that empties much faster... how to get 99.8% pure oxalic acid... two different grades of benzoic acid... phosphoric anhydride as a desiccant

various handling precautions.

Just check and send the coupon below for a copy.

Benzoic acid in new crystal form

Customers told us there were three ways to improve benzoic acid. Make it dissolve faster. Make it freer flowing. Get rid of irritating fines.

We've done all three with a new Crystal Benzoic Acid.

Both the crystals and a powdered form are available in two grades. U.S.P. grade assays 99.3% min.; technical grade is 98.0% pure. Both grades have 0.2% max. water content.

Check the coupon for more data on benzoic acid and its chemical cousin, sodium benzoate, which we also supply in U.S.P. and technical grades.

What do you want to dehydrate?

If you have a drying problem, don't overlook phosphoric anhydride, P₂O₅. This OLDBURY product is one of the strongest known desiccants.

A white fluffy powder assaying 98% min. P₂O₅, it contains no sulfate. This is an important advantage in one of its major uses—as a condensing agent in making clear methacrylate resins.

If you're interested in phosphoric anhydride for a present or a potential use, just check the coupon for more complete information.

For more information on chemicals mentioned on this page, check here:

- | | |
|---|--|
| <input type="checkbox"/> Caustic Potash | <input type="checkbox"/> Benzoic Acid |
| <input type="checkbox"/> Sodium Sulfide | <input type="checkbox"/> Sodium Benzoate |
| <input type="checkbox"/> Sodium Sulfhydryte | <input type="checkbox"/> Phosphoric Anhydride |
| <input type="checkbox"/> Oxalic Acid | <input type="checkbox"/> New list of products—
Bulletin 100-B |

Clip and mail to us with your name, title, and company address. (When requesting samples, please use business letterhead.)

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HOOKER
CHEMICALS
PLASTICS

How RYKON GREASE

has performed in seven tough applications

In just two years since introduction, **RYKON** Grease has stepped in to deliver lubrication in hundreds of applications where other greases have failed

In the process industries where higher speeds, loads, temperatures and pressures are being put on bearings as a means of increasing productivity of equipment, a new

type of grease has been needed. RYKON is that grease. Here are just seven examples of how RYKON Grease has performed in tough spots:

Industry	Equipment	Type of Bearings	Conditions	Remarks
Packing Company	can closers	various	high temperature, heavy load, wet	Outperforms previously used greases.
Brewery	washers, conveyors	various	high temperature, wet	Lasts longer and does a far better job on all applications.
Packing Company	canning machines	plain and anti-friction	wet	Very satisfactory.
Chemical Laboratory	washers and degreasers	anti-friction	wet	Better than any grease tested in degreasing solvent.
Automotive Parts Mfr.	reciprocating pump bearings	plain	wet	Pumping chemicals. O.K. after one month. Previous grease caused about one bearing failure per week.
Paper Mfr.	liquid sulfur pump	anti-friction	high temperature, wet	Has extended life of bearings.
Paper Carton Mfr.	all grease-lubricated parts	various	high temperature, heavy load, wet	Replaced eight different greases. Stays in better.

The reason RYKON Grease can perform under conditions that cause other greases to fail is this: RYKON Grease has a unique non-soap, organic thickener. This thickener holds the oil between its fibers better than any other gelling agent. The thickener is able to withstand extremely high as well as low temperatures. It resists chemical action and remains stable under conditions of severe working and water washing. RYKON Grease has exceptional anti-rust properties.

RYKON Grease's unique properties make it truly multi-purpose. This leads to many

worthwhile economies. With one grease to do possibly every grease lubrication job in a plant, there's no chance for application mistakes. Inventory and handling of many single-purpose greases is reduced or eliminated and maintenance training and supervisory follow-up is greatly reduced.

More facts about RYKON Grease are yours for the asking. Call the lubrication specialist in your nearby Standard Oil office in any of the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**

You expect more from **STANDARD** *and you get it!*



Oven test shows high temperature performance of RYKON Grease. 1. Metal panel coated with RYKON and placed in oven at 350° F. 2. Same panel after five days. RYKON is still soft and ready to lubricate. 3. Another high-melt grease ready for same test. 4. Same panel after oven test. Grease has failed completely.

Check 4133 opposite last page

CHEMICAL MATERIALS

direct competitors, they have shown farsighted leadership in working together. Since early cooperation produced a 100% amylopectin starch in 1942, they have collaborated in specialty corn production.

Amylomaize I is the most recent result of this cooperation. In addition to being a potentially important commercial raw material it could well help halt the growth of the 1.3-billion-bushel heap of surplus corn now held by the government.

Possible Applications

Films are expected to be one of the largest uses, at least at first. Tough, flexible, water-proof films similar to cellophane have been made experimentally. Also lab produced have been water-soluble films, a possible adjunct to a growing trend toward "built-in maid service" in frozen and other packaged foods. Just drop the whole package in water and the film dissolves.

Due to the time lag inherent in new hybrid production, it will be at least 1961 before any commercial crops can be brought to harvest. However, some experimental acreage has been planted and research quantities are available.

(For more information on Amylomaize I contact American Maize-Products Co., Roby, Indiana, or National Starch Products Inc., 750 Third Ave., New York 17, N.Y.)

Check 4134 opposite last page.

Granulation not necessary for tablet preparation

Dried aluminum hydroxide gel is used to eliminate granulation step in preparation of tablets. This form of chemical permits dry mixing of incompatible formulas which formerly were not formable into tablets. Gel meets USP XV standards.

(Lump form F-2000 $\text{Al}(\text{OH})_3$ gel is a product of Reheis Company, Inc., Berkeley Heights, N.J.)

Check 4135 opposite last page.

**PVC fungus checkmated
by additive**

Plasticizers are compatible
with inhibitor

Uses: To prevent mildew in many plastic products. Adaptable to fungicidal performance on textiles, canvas, wood, and rubber.

Features: Inhibitor does not result in discoloration or loss of tensile strength and has heat- and light-stability. Additive is compatible with usual PVC plasticizers and stabilizers and presents no compounding problems.

Description: Inhibitor of fungus growth in both semi-rigid and flexible polyvinyl-chloride compounds as well as in their copolymers. Physical characteristics are as follows:

Form	white powder
Size	100% through 50 mesh
Bulk density	0.45 g/cc
Specific gravity	1.4
Melting range	250-290°F
Boiling range	over 500°F

(Ottacide P is a product of Ottawa Chemical Company, 823 Hamilton Street, Toledo 7, Ohio.)

Check 4136 opposite last page.

**Vulcanizes to rubber
in only 30 minutes
at room temperature**

Uses: Material is suitable for sealing and caulking metal-to-metal and metal-to-rubber joints; potting and encapsulating electrical and electronic parts; as a mold or impression material for making prototype parts; as a shock and vibration absorber for delicate components.

Features: Easy-to-apply liquid is faster setting and vulcanizes to rubber in only 30 minutes.

Description: Silicone rubber retains its flexibility from -70 to 500°F, and has good electrical insulating properties. It resists weathering, moisture, ozone, and corona.

(Silastic RTV 502 is product of Dow Corning Corp., Midland, Michigan.)

Check 4137 opposite last page.

it's what
it doesn't have
that makes it good!

National
ANILINE

What doesn't our aniline have that makes it so good?

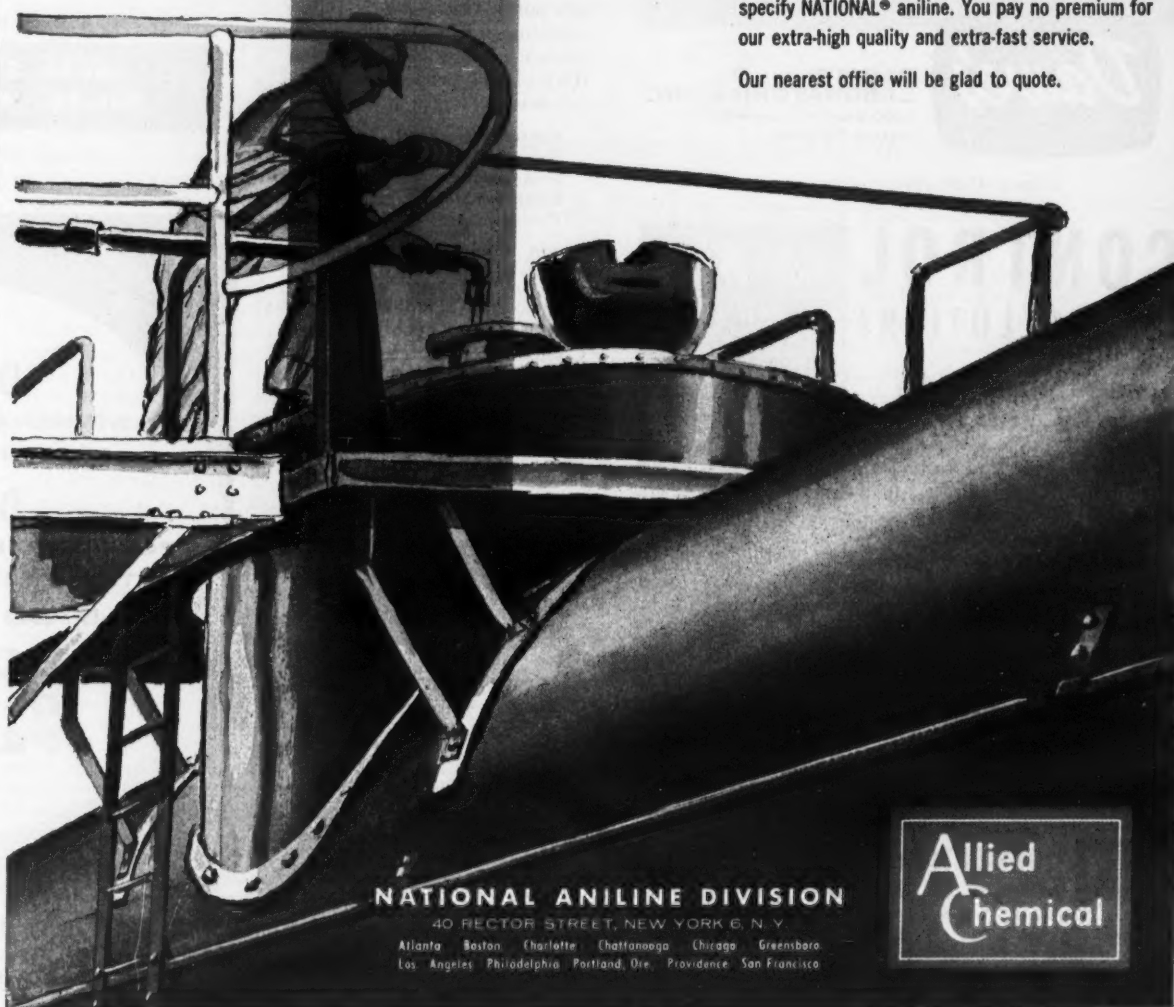
It has very little moisture (4/100 of 1% maximum).

It has very little color (Barrett Standard 1.0).

It has very low total impurities. (Our shipping spec is 99.9% but we regularly load cars analyzing 99.95+% That's better than ACS CP aniline specs).

So if you want clear, colorless, nearly dry, high-purity aniline shipped by tank car or tank wagon from Moundsville, West Virginia, on 24-hour notice, specify NATIONAL® aniline. You pay no premium for our extra-high quality and extra-fast service.

Our nearest office will be glad to quote.



NATIONAL ANILINE DIVISION

40 RECTOR STREET, NEW YORK 6, N. Y.

Atlanta Boston Charlotte Chattanooga Chicago Greensboro
Los Angeles Philadelphia Portland, Ore. Providence San Francisco

**Allied
Chemical**

Check 4138 opposite last page

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SODIUM GLUCONATE
and
GLUCONIC ACID

Promptly available in any quantity.

Warehouse stocks across the country.

Dawe's high quality is assured.

Write for technical data and samples.

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Check 4139 opposite last page

CONTROL AIR POLLUTION!

**FREE BROCHURE
TELLS YOU HOW**

Now learn how you can clean up combustible pollutants, fumes and odors from your processes. An Oxy-Catalyst System can be engineered to your special requirements. Catalytic oxidation is the most effective air pollution control and waste heat recovery method ever developed! Installation often leads to actual fuel savings. Investigate! Send today for brochure, "Oxycat Systems"—packed with facts and figures on typical industrial installations. Mail coupon below.



OXY-CATALYST, INC. Wayne 7, Pa., U.S.A.

Catalysts for fume and odor elimination, air pollution control and waste heat recovery
Send me free brochure, "Oxycat Systems"

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Firm _____
Street _____
City _____ Zone _____ State _____

Check 4140 opposite last page

CHEMICAL MATERIALS

**Paint additive improves
wetting, dispersion,
anti-settling**

Agent is also film-former

Uses: In paint, putty, caulking compounds, and wood fillers.

Features: Wetting, dispersion, and anti-settling properties improved. Since agent is film-former, it may be used to replace an equivalent amount of vehicle in finished paint.

Description: Film-forming, surface-active agent shortens grinding time and produces finer dispersions and better color development. Higher pigment loadings in pastes are possible.

More efficient pebble-mill grinds result from elimination of puffy structures. Paints containing additive have less tendency toward gellation. Physical properties are as follows:

Viscosity (Gardner)	5
Non-volatile	80%
Acid number	10-12
Lieberman-Storch	Positive
Density	8.4 lb/gal

Agent is packed in 1-, 5-, and 55-gal drums.

(Raybo 56-MagnaMix is a product of Raybo Chemical Company, Huntington, W. Va.)

Check 4141 opposite last page.



"Red, green, yellow —
anything! But not
another 'clear, colorless
liquid' please!"

CUT PLANT MAINTENANCE COSTS

WITH



KERPON PROTECTIVE COATINGS

Phenolic, Epoxy, Latex Resins —
All Type Applications!

MINIMIZES CORROSION in Tanks—Vats—Pipes—all
Containers, any Exposed Metal

PROTECTS AGAINST highly concentrated Acids —
Fumes — Caustics — Alkalies — Abrasives — Heat

PROVEN SUPERIOR in Resistance—Flexibility—Long
Life — Reduction of Deterioration Under the
Most Extreme Corrosive Conditions

KERPON PROTECTIVE COATINGS
Faster to Apply — Cost Less

For an Easy Solution to Your Corrosion Problems—write

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Box 89 • PARK RIDGE, ILL.

Check 4142 opposite last page

DO YOU
STYRENE ALKYLDS OR
ESTERIFIED EPOXIES?

DO YOU
POLYMERIZE SILICONE RESINS,
ETHYLENE OR ACRYLATES?
IF SO—YOU NEED
LUCIDOL'S
Di-t-BUTYL
PEROXIDE



LUCIDOL DIVISION

WALLACE & TIERNAN INCORPORATED
1740 MILITARY ROAD
BUFFALO 5, NEW YORK

Check 4143 opposite last page

CHEMICAL PROCESSING

CHEMICAL MATERIALS

Glass backbone for molder with good surface finish, chemical resistance

Use entails cost saving over regular materials

Uses: In housings for appliances, instruments, and similar products.

Features: Molding compound has good surface finish and chemical resistance. Its use will result in cost reduction.

Description: Glass-fiber reinforced polyester molding compound has following properties:

Bulk factor	3:1
Form	Fibrous putty
Standard color	Grey
Shelf life	

2 months min, under 90°F

For most compression applications 400 to 800 psi is adequate. A 1/16" section can be cured in 40 seconds, and a 1/8" section can be cured in 1 1/4 minutes, both at 300°F.

(Thermaflow 105 is a product of Chemicals Division, Atlas Powder Company, Wilmington 99, Delaware.)

Check 4144 opposite last page.

Uniformity is certified in calcium stearate aqueous dispersion

Uses: Material was formulated for paper coating applications.

Features: High stability and low viscosity are claimed for this dispersion. Its uniformity is certified.

Description: Low viscosity aqueous dispersion of calcium stearate has solids content of 41-42% and less than 2% surface active agent. When added to coating color formulations, it imparts plasticity and lubricity to the coating. It also gives increased gloss, brightness, and wet strength to the paper.

(Nuodex 869 is formulated by Nuodex Products Co., Heyden Newport Chemical Corp., 342 Madison Ave., New York 17, New York.)

Check 4145 opposite last page.

Answering Two Problems in Rotary Precoat Filtration

It has been known for years that rotary precoat filtration, either vacuum or pressure, offers substantial advantages in many operations, especially where large fluid volumes or high concentration of solids are involved. As in all processes, however, certain difficulties have been encountered. One of these is the cracking of the precoat, due to cake shrinkage, which causes a loss of differential pressure across the cake. This in turn complicates control of the knife cut required for stable operation. Compensating for this by setting the knife deeper than necessary, while effective, results in greater filteraid consumption and increased costs.

An answer to this problem is now available in special Dicalite Filteraids "engineered" for precoat use. By careful control of the shrinkage characteristics, cracking has been minimized and undesirable instability of the precoat is avoided. At the same time, these filteraids have been designed for fast flowrates and excellent clarity. They have been outstandingly successful in actual use, where reports indicate that the 'normal' knife cut of from .003" to .005" should give good results in all but exceptional cases.

Another problem in the field of rotary precoat filtration has been the difficulty of determining beforehand the actual performance of such filtration in a specific application. Theoretical filtration data is not sufficiently accurate, and pilot plant testing, while reliable, is both expensive and time-consuming. It is understandable, therefore, that many plants have hesitated to make the capital investment required to obtain the advantages of rotary precoat filtration without more exact preliminary information.

This problem now is answered by a new Dicalite-developed Filter Test Leaf. While there have been similar test devices in the past, this Dicalite Test Leaf is the first which permits accurate determination of the effect of all process variables, including the all-important factor of shave-off or depth of cut. Working with a few gallons of process liquor, this laboratory-scale instrument gives in a few hours the answers which formerly could have been obtained only with elaborate and lengthy tests—and with an accuracy frequently greater than given by such tests. In all cases to date, the results obtained with the Dicalite Test Leaf have been remarkably close to those subsequently obtained in plant use.

Since this device was first made available last year, it has been quickly accepted by industry. Many of these Test Leaves have been acquired by both filter operators and filter manufacturers, and are in steady use.

Paul W. Leppla, Technical Director

See...
NO CRACKING!



2 special Dicalite Filteraids overcome the greatest difficulty in Rotary Precoat Filtration

Comparative tests—full-scale plant production runs made with their own equipment by firms using rotary vacuum precoat filters—proved these two Dicalite Special Grades superior to any other filteraid tested, particularly in freedom from cracking of the filter cake. This freedom from cracking, plus fast flowrates, excellent clarity of filtrate and low filteraid consumption are characteristics built into these filteraids by a technical staff which took full advantage of Dicalite's multiple deposits of high-grade crudes of differing types. These provide a natural headstart in the development of filteraids 'tailor-made' to meet the special requirements of almost any industrial or technical application. And Dicalite's now-famous quality control system insures continued adherence to the most rigid specifications.

These are the reasons for the provable superiority of these Dicalite Special Grades in rotary precoat filtration. Call your Dicalite man, and see for yourself.

If you would like more information on Dicalite advantages in any type of filteraid filtration, call or write

Dependable
Dicalite
DIATOMACEOUS MATERIALS

DICALITE DEPARTMENT, Great Lakes Carbon Corporation • 612 So. Flower St., Los Angeles 17, Calif.

Check 4146 opposite last page

DAVISON

separator

best
.....
with Davison Silica Gel

Tell us what you wish to separate. We'll supply you with a selective adsorbent of very high capacity; one that will maintain a low dew point and have excellent physical strength. It will have low pressure drop—the ability to recover hydro-carbons, if needed. The chromatographic properties of Davison Silica Gel make it ideal for the determination of aromatic compounds; the precision separation of water from gas, of 2 compounds in a single system or any of count-

less others. Davison Silica Gel formulated to your needs will be the finest separator you can use—give you real economy over long life. For the best, write Dept. 3713 today. We'll supply you with full information.

W.R. GRACE & CO.
DAVISON CHEMICAL DIVISION
BALTIMORE 3, MARYLAND



Check 4147 opposite last page

CHEMICAL MATERIALS

Cuts maintenance costs and catalyst use

Sharply reduces catalyst chipping and loss in fines

Uses: As cracking catalyst.

Features: Material is designed to decrease catalyst use and reduce equipment maintenance costs. It is claimed to sharply reduce catalyst chipping and loss in fines.

Description: Spherical, mineral, Kaolin cracking catalyst provides maximum octane at low cost, high activity, sulfur resistance, high thermal stability, and good regenerability. Catalyst is expected to be especially effective for all moving bed cracking units.

(Kao-Spheres are product of Houdry Process Corp., 1528 Walnut St., Philadelphia 2, Pennsylvania.)

Check 4148 opposite last page.

Polyether urethane catalyst is extremely active

Agent permits single-step polyether foaming

Uses: As catalyst for manufacture of polyether foams.

Features: Catalyst is more active than amine-type commonly used. Use permits one-step conversion of polyethers to polyether-urethane foams.

Description: Catalyst is special grade of dibutyl tin dilaurate. It is available in 55-gal drum quantities.

(Niax catalyst D-22 is a product of Union Carbide Chemicals Company Division, Union Carbide Corporation, 30 East 42nd St., New York 17, N.Y.)

Check 4149 opposite last page.

Organo metallics are subject of 36-page brochure in which over 200 research chemicals and their physical constants are listed. A section is also devoted to chemicals available in commercial quantities. "Research Chemicals . . . Organo Metallics" — Anderson Chemical Co., Stauffer Chemical Co., 380 Madison Ave., New York 17, New York.

Check 4150 opposite last page.

CHEMICAL PROCESSING

**Low-foaming casein
has low, stable
viscosity**

Biologically stable agent
needs no preservatives

Uses: As pigment dispersant,
latex or asphalt stabilizer,
emulsifying agent, or wax
modifier.

Features: Biologically stable,
low-foaming casein has low,
stable viscosity.

Description: Dry, granular,
light-yellow casein is soluble
in cold water containing alkali.
It is also dilutable with
alcohol, glycerol, and glycols
and does not thicken latex.
Other physical properties follow:

Solids	90-95%
pH	8.5
Viscosity (25% solution)	200-1000 cps
Grind	98% through 80 mesh

Five-lb/gal (dry) casein is
packed in 100-lb, 5-ply paper
bags. It can be stored at least
one year and is not harmed by
freezing.

(Protovac casein PV-800 is a
product of The Borden Chemical
Company, Division of The
Borden Company, 350 Madison
Avenue, New York 17, New
York.)

Check 4151 opposite last page.

**Thermoplastic molder
has light stability,
strength, clarity**

Material can be processed
on conventional equipment

Uses: For molded and extruded parts.

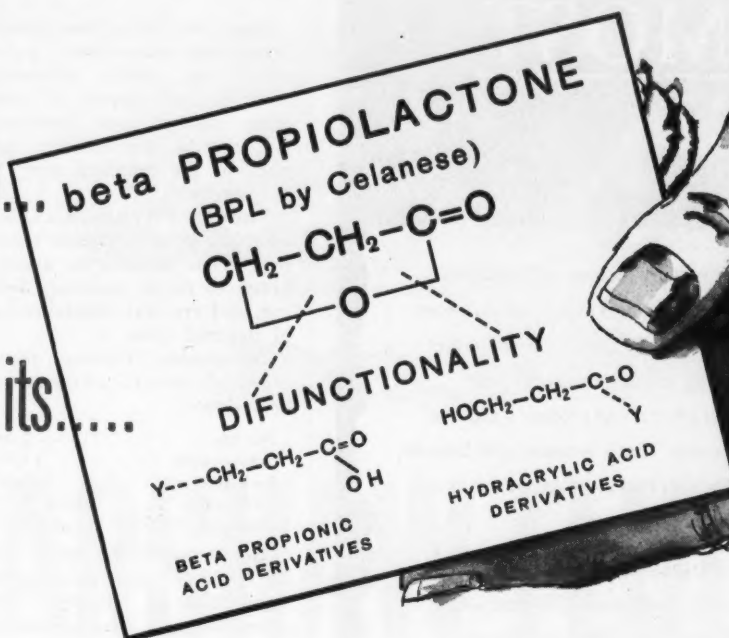
Features: Thermoplastic has
clarity, strength, and light
stability.

Description: Copolymer of
styrene and methyl methacrylate
is fabricated like higher
heat-resistant formulations of
polystyrene. It can be processed
on conventional equipment.
Thermoplastic is available
only in granular form.

(Zerlon 150 is a product of
Plastics Division, The Dow
Chemical Company, 1000 Main
Street, Midland, Mich.)

Check 4152 opposite last page.

what
can
you
do
with...
and its....



now available in commercial quantities

Latest news in intermediates is beta-Propiolactone (BPL),
a starting material with remarkable versatility—difunctionality—
that immediately suggests the synthesis of important new products.
How can you use BPL—or its derivatives? In starch emulsions?
In adhesives? In textile fibers? Why not find out immediately?

Write today for samples for your own evaluation, and for
technical Bulletin No. N-61. Celanese Corporation of America,
Chemical Division, Dept. 591-C, 180 Madison Avenue, N. Y. 16.
Celanese® BPL™.



**TYPICAL PROPERTIES
OF CELANESE BPL**

beta-Propiolactone, wt. % min.	97
Physical state	Liquid
Color	Colorless
Odor	Pungent, acrylic
Boiling Point, deg. C.	162
Refractive index @ 20°C	1.4131
Specific gravity @ 20/20°C	1.1490
Pounds per gallon @ 20°C	9.56
Flash point, Tag open cup, deg. F.	165

Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Avenue, New York 16, N. Y.

See Chemical Materials Catalog and Chemical Week Buyers' Guide for complete listing of Celanese Chemical Products.

Check 4153 opposite last page

At El Dorado

PURITY IS FOREMOST

IF YOU use coconut oil fatty acids or methyl esters in your formulations, Foremost-El Dorado's standards of purity and uniformity can give you a better end product—and less trouble. That's because, at El Dorado, Purity is Foremost... and has been for over 65 years.

EXAMPLE: Eldo Myristic acid is consistently over 95% pure—the purest commercially produced.

Write or phone today for samples and specifications. Department B-2.

FATTY ACIDS

Caprylic	Capric	Lauric
Myristic	Palmitic	
Cocoleic	Eldhyco*	Coconut

METHYL ESTERS

Caproate	Caprylate	Caprate
Laurate	Myristate	Palmitate
Oleate	Eldo* 18	Coconate

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Cleveland: F. W. Kamin Company	Detroit: Harry Holland & Son, Inc.	Houston: Joe Coulson Company	Kansas City: Vulcan Sales Company
Minneapolis: M. H. Baker Company	New Orleans: Brettreich & Sheahan Company	New York: H. Reisman Company	
Oakland: Foremost Food & Chemical Co.	Oklahoma City: Rullman Brothers	St. Louis: Harry A. Baumstark & Company	

Check 4154 opposite last page

CHEMICAL MATERIALS

Adhesive gives moisture no chance to do dirty work

High-tensile-strength bond is quick-drying

Uses: Bonding of steel, brass, aluminum, glass-fiber polyester and epoxy, polyvinyl chloride, and wood to each other and to new concrete. Adhesive is particularly applicable for bonding new to old concrete.

Features: High-tensile-strength bond prevents moisture from seeping in around joints to cause spalling, flaking, and gradual disintegration of patched area.

Description: Physical properties of uncured adhesive are as follows:

Pot life	1½ — 2 hr
Setting time	3-4 hr
Tack-free time	8-24 hr
Flash point	above 80°F
Coverage	120 sq ft/gal at 10 mil

New concrete can be poured 30 to 60 minutes after initial application of adhesive. Two components of modified epoxy are mixed immediately before use, applied by brush, and cured at normal temperatures.

(Adhesive 348 is product of The Ceilcote Company, 4832 Ridge Road, Cleveland 9, O.)

Check 4155 opposite last page.

Polyurethane rubber cross-linking agent has 0.05% moisture

Uses: As cross-linking agent for urethane rubbers.

Features: Agent meets specification of 0.05% maximum moisture. It is said to be easily incorporated.

Description: Anhydrous glycol is available in bulk drum quantities. Although present emphasis is on rubber applications, glycol may also be suitable as an intermediate in manufacture of other plastic materials.

(1,4-Butanediol Anhydrous is product of Antara Chemicals, Division of General Aniline & Film Corp., 435 Hudson St., New York 14, New York.)

Check 4156 opposite last page.

New! ELGIN Junior 120* DEIONIZER



For:
Laboratory
Research
Commercial
Industrial uses

***Delivers up to 120 GPH of high quality deionized water**

Now a deionizer that fills a long felt need—a unit for those whose needs are not great enough to justify a large deionizer, but too great to be handled by small, portable laboratory apparatus. It gives you high quality water comparable to that produced by the Elgin mixed-bed Ultra Deionizer—water actually freer from mineral impurities than distilled water... at continuous flow rates up to 120 gallons per hour, and at remarkably low cost!

Illustration tells story. This compact unit—only 45" high—comes to you complete and ready to go. Hooks right into your water supply line. Delivers demineralized water under line pressure any place you want it. Handsome stainless steel cylinder contains four bags of resin ion exchange material that does the work. When resistance of effluent falls below 50,000 ohms (the measure of commercially distilled water) built-in ohm meter actuates pilot signal and you replace spent material with fresh bags which are supplied right with the unit. Then you return the exhausted bags to Elgin in convenient shipping container which we furnish. We then promptly regenerate it and return it to you so that you always have a fresh supply on hand... a planned and organized service. There is:—

No regeneration—no acid or alkali to handle—no backwashing—no drain needed—no trained operator required. Our well organized resin exchange service does the whole job for you. Cost of equipment and service is low. Final result: continuous supply at way below distilled water costs.

Write for facts

ELGIN SOFTENER CORPORATION

180 N. Grove Ave., Elgin, Illinois

Representatives in principal cities

In Canada: G. F. Sterne & Sons Ltd., Brantford

Check 4157 opposite last page

CHEMICAL PROCESSING

Use of pre-cooked starch halves operation

Cold-water-swelling carrier starch for use in corrugating industry is now available. Pre-cooked starch is simply added to cold water and mixed. Entire batch is prepared in secondary mixer, thus saving a step.

Material increases adhesive efficiency by retaining more water than conventional, cooked-carrier starch. Break-down is resisted even under severe conditions of shear encountered in circulating to and from combiner.

(Kobond starch is a product of National Starch Products Inc., 268 Madison Avenue, New York 16, N.Y.)

Check 4158 opposite last page.

Release agent cures to hard, smooth film, won't mark surface

Uses: Material has demonstrated its effectiveness as a semi-permanent release of epoxy castings, polyurethane foams, ice, rubber, and plastic goods.

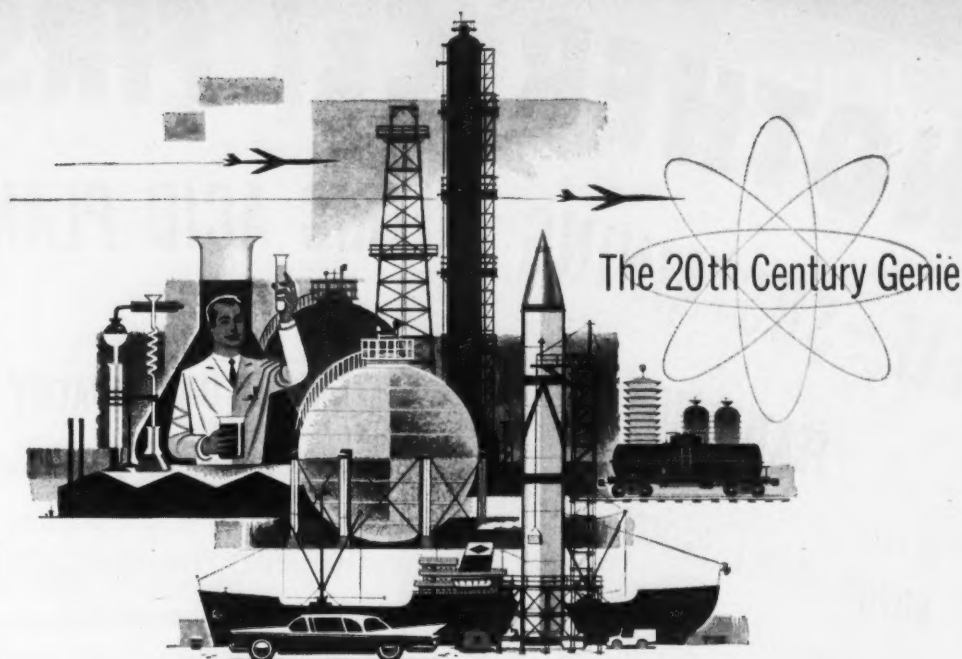
Features: Easily applied with conventional pressure types of spray equipment, agent cures to hard, smooth film and does not mark the surface. It provides a uniform coating and gives multiple release without reapplication.

Description: Liquid release agent has a base of silicone resin. In tests, a single application of the agent provided over a dozen releases from the mold. It does not come off on the molded part.

(MR-22 is product of Peninsular Silicones, Inc., 209 Houseman Building, Grand Rapids, Mich.)

Check 4159 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.



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One of the largest facilities in the world for the manufacture of fluorides makes available a long list of Harshaw quality fluorine compounds. If required, you are invited to draw on the knowledge and experience of our staff of technical specialists on fluorides. We have a background of more than forty years experience as a major producer.

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Ammonium Fluoborate
Antimony Trifluoride Sublimed
Barium Fluoride
Bismuth Fluoride
Boron Trifluoride
Boron Trifluoride Complexes
Cadmium Fluoborate
Chromium Fluoride
Copper Fluoborate
Fluoboric Acid

Fluorine Cells
Fluorinating Agents
Frosting Mixtures
Hydrofluoric Acid Anhydrous
Hydrofluoric Acid Aqueous
Hydrofluosilicic Acid
Lead Fluoborate
Lithium Fluoride
Metallic Fluoborates
Nickel Fluoborate

Potassium Bifluoride
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Zinc Fluoborate
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C&I nitric acid plants will operate in excess of 340 days per year at their guaranteed capacity and efficiency.



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C&I's self-sustaining nitric acid units are capable of producing up to 300 tons-per-day (100% HNO_3). Only the finest proven materials and components are utilized guaranteeing maximum safety and dependability. The design is an adaption of the du Pont high pressure process and their rigid specifications are adhered to exactly.

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Maybe you don't.

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PETROCHEMICALS

SECTION OF

**CHEMICAL
PROCESSING**

Night view of British Hydrocarbon Chemicals plant at Grangemouth, Scotland, taken from the east bank of River Avon. Large unit at left is cooling tower



During the past four years production and capital investment in petrochemicals doubled in the United Kingdom while production of all chemicals increased one-third. Although neither oil nor natural gas is to be found in the country —

BRITISH PETROCHEMICALS LARGEST OUTSIDE NORTH AMERICA

DR. S. W. SAUNDERS, Chairman
Heavy Organic Chemicals Division
Imperial Chemical Industries Limited



Dr. Sidney Walter Saunders is the first chairman of Imperial Chemical's Heavy Organic Chemicals Division, formed in early 1958, and is in charge of his company's petrochemical activities. He has been one of the U.K. members of the Petroleum Chemicals Working Party of the Chemical Products Committee of OEEC since the Party's inception in 1953. Since receiving his PhD in chemistry from University College London, where he was a Ramsey Fellow, Dr. Saunders has spent most of his career in various production and managerial positions at ICI

Petrochemical growth has been one of the most rapid of any field in the U.K. During the past four years capital investment in petrochemical plants has doubled to the present \$314 million. During this same period, production of all chemicals increased only one-third. Percentage increase in consumption of feedstock was only one-half the increase in carbon content of products made. This shows that there has been a marked increase in efficiency of conversion of feedstock into petrochemicals during the past several years.

Since neither crude oil nor natural gas is to be found in the United Kingdom, petrochemicals have been largely based on gas oil or naphtha — materials which are readily obtainable and transportable. The U.K. has pioneered in the development of large naphtha

crackers, now used on a world-wide basis for producing primary petrochemicals from whatever feedstock is readily obtainable. This has enabled the U.K., as well as other countries, to carry out petrochemical operations at locations quite independent of refinery operations. Several large petrochemical centers have developed in the United Kingdom.

Stanlow

First petrochemical plant in Western Europe was built by Shell in 1942 at their refinery at Stanlow (Cheshire) to produce Teepol synthetic detergent, an alkyl sulfate whose petrochemical base comes from the cracking of byproduct wax. A large plant to make solvents from refinery gases was added in 1949 and

To next page

other plants since then to produce sulfur, sulfuric acid, lube oil additives and Epikote resins. Associated Ethyl Co. uses ethylene from Stanlow in an adjacent plant making tetraethyl lead.

British Celanese (merged with Courtaulds in 1957) was

a pioneer in the cracking of oil for ethylene and propylene. Since the early 1940's this company has operated such a plant at Spondon (Derbyshire) to give them the basic materials required for acetate silk manufacture.

Peak of the original growth

of U. K. petrochemicals occurred in 1951, when production began at three centers. All were quite independent of each other but all used the key operation of the cracking of naphtha for the lower olefins. These three centers are Wilton/Billingham, Grangemouth, and Partington.

Wilton/Billingham

Imperial Chemical Industries began integrated petrochemical activities in 1951 at a new plant at Wilton (North Yorkshire) and an existing large Billingham (Durham) plant — linked to each other by a 10-mile pipeline which had to pass under the River Tees near its mouth.

Wilton/Billingham has a unique position in the petrochemical world. It is a major center in tonnage and diversity; it is operated solely by the chemical industry; it receives the whole of its petrochemical raw materials by sea; and it exemplifies the type of future activity (foreseen by the OEEC Chemical Products Committee) in which these raw materials are specially produced and not obtained from direct refinery operations as in the past.

No less than three of its major chemical end-products come from process inventions and exploitations in which ICI pioneered — Alkathene high-pressure polyethylene, Terylene polyester fiber (known as Dacron in the U.S.A.) and plasticizer alcohols made by the Oxo process. This process utilizes Billingham's knowledge of high-pressure techniques, and availability of $H_2 + CO$ gas on tap.

Original naphtha cracker, which was the basis of Wilton operation in 1951, was duplicated in 1956 and a third will be in operation in 1959. In 1959 Alkathene production will be more than quadrupled compared with 1951. Ethylene oxide (made by the chlorhydrin process using Wilton chlorine) and glycol, and Lissapol N non-ionic detergent have been made since operations began. Production of the petrochemical intermediates

required for Terylene began in 1954, and by 1960 capacity of the Wilton Terylene plant is planned to be more than five times that of the original installation.

Propylene and butylene fractions from the cracker (after extraction of butadiene at Wilton) are piped to Billingham. Here isopropanol and acetone are made, and a very large tonnage of Oxo alcohols — butanol from propylene, and a range of C_8 and C_9 plasticizer alcohols from olefinic raw materials specially chosen and imported for the particular carbonylation product required.

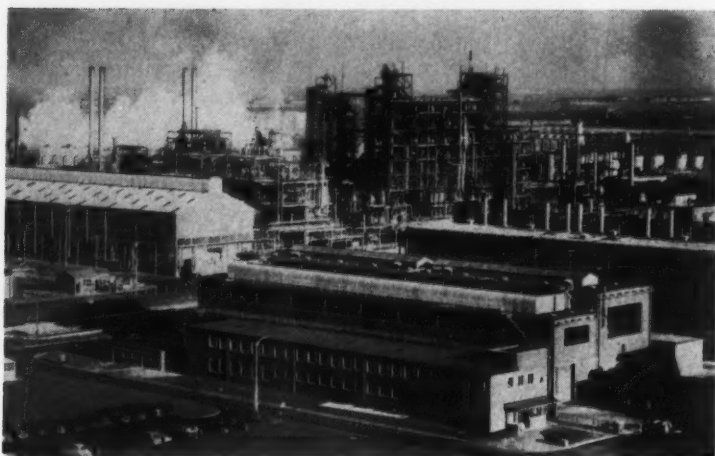
ICI is one of the world's biggest producers of synthetic ammonia and methanol, all up to now made from coal. An expansion of Billingham capacity this year will however be based on fuel oil. It has been announced that development of company's new 1000-acre Severnside site (near Bristol, Gloucestershire) will be based on oil rather than coal.

Grangemouth

British Petroleum Company has at Grangemouth (Shetland) an old established but completely modernized refinery which became the source of raw material for petrochemicals made by British Hydrocarbon Chemicals (BHC) formed jointly by B. P. and the Distillers Co. The latter has long been established as makers of organic solvents based on fermentation alcohol from molasses.

BHC first cracked naphtha, to make ethanol and isopropanol, in 1951. Since then cracking capacity has been doubled, and butadiene extraction and tetrapropylene manufacture have been added. In 1959 a cumene/phenol/acetone plant and a Phillips polyethylene plant will be commissioned. In 1960 cracking capacity will again be doubled.

Forth Chemicals, formed jointly by BHC and Monsanto, has made styrene at Grangemouth since 1953. By 1956 the capacity was almost quadrupled. The plant at present



Olefin plants of ICI at Wilton



Section of Esso petroleum chemicals plant at Fawley. Here butylenes are dehydrogenated to butadiene

supplies entire domestic requirements of the U.K. Grange Chemicals, owned by BHC and Oronite Chemical, makes detergent alkylate from BHC's tetrapropylene. Union Carbide has just begun production of low density polyethylene from BHC ethylene.

Partington

Partington, (Lancashire) is the location of a plant originally built by the independent firm, Petrochemicals Ltd., which set out to make a multiplicity of organic products from olefines made by cracking naphtha. Production began in 1951 after considerable delays. Some of these were due



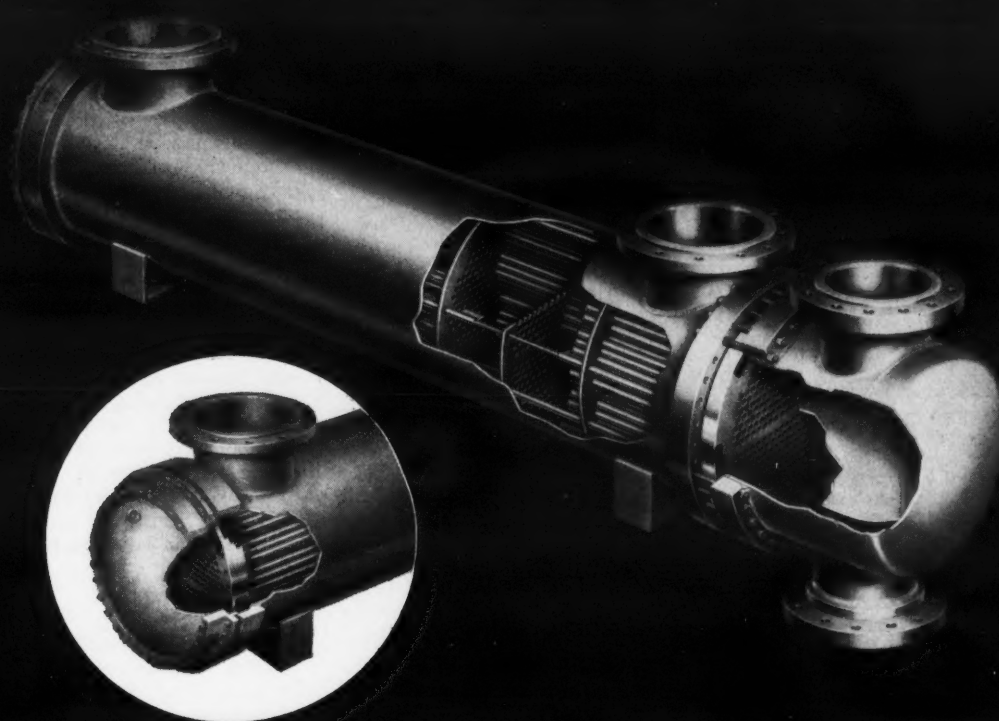
Fractionating equipment on Shell Chemical ethane-ethylene unit at Stanlow, Cheshire

to the untried status of the processes involved. Achievement of profitable levels of output was also hampered by lack of capital.

Partington is, however, not far from Stanlow, and in 1955 Shell acquired Petrochemicals. Plant is now rapidly being built up into main center of production for recently formed subsidiary, Shell Chemicals. Products now or soon to be made at Partington are ethylene oxide and derivatives (glycols, ethanolamines, detergents), propylene oxide and derivatives, Ziegler polyethylene, and styrene.

Ethylene oxide is now made via chlorhydrin, but a new plant will shortly come into operation using Shell Development's own direct process. A major expansion of ethylene (and propylene) production is

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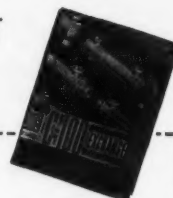


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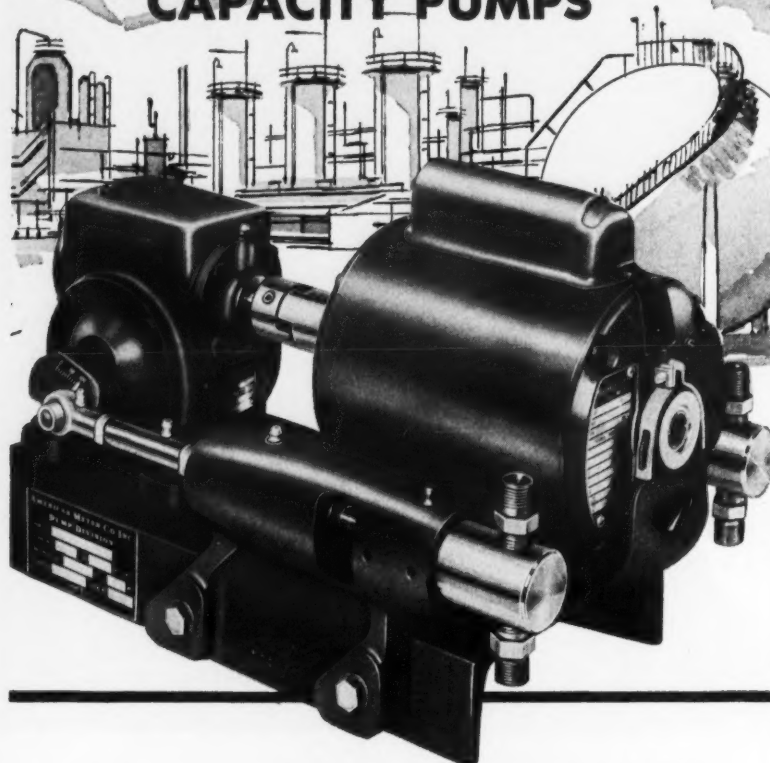
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AMERICAN
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Check 4163 opposite last page

PETROCHEMICALS

planned, based on a large new naphtha cracker. At the same time a 25-mile pipeline system to connect Partington and Stanlow is to be provided to replace the present transport of material by barge on the Manchester Ship Canal.

Shell Haven

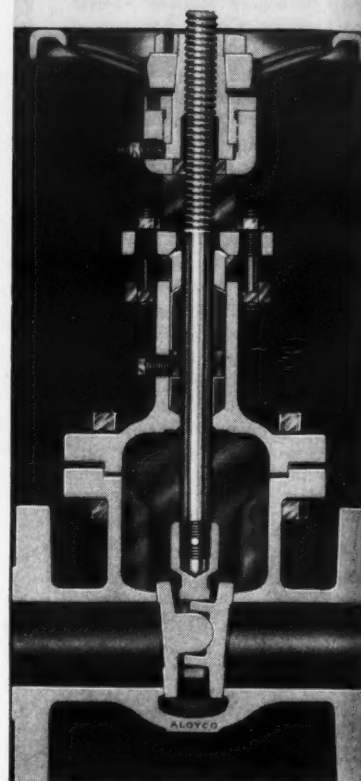
Shell's new refinery at Shell Haven (Essex) has at present only one petrochemical activity — production of dodecyl benzene. By the end of 1958 a plant will be commissioned to make 75,000 tons per year of ammonia. Shell's process for gasification by partial oxidation of refinery products which may become surplus from time to time — ranging from gas to asphalt — will be used. The ammonia will be further processed to ammonium nitrate and nitrate fertilizers, by Shell and by Fisons, the fertilizer makers at an adjacent plant.

Fawley

Esso has just formally opened a \$28 million complex of petrochemical plants at company's large refinery at Fawley (Hampshire). They include a naphtha cracker to make olefins and a plant to make butadiene from butylene. Most of the butadiene will be used by International Synthetic Rubber Co. to make SBR (GR-S) rubber in an adjacent plant. Two companies are building plants at Fawley to use Esso's ethylene — Monsanto to make polyethylene by the Badische high-pressure process, and Union Carbide to make ethylene oxide by the direct process.

This brief survey indicates how successful the U.K. has been in developing petrochemicals on the broadest basis, despite the complete lack of any indigenous raw material. There are two directions in which a switchover from coal as basic raw material has not yet developed. Practically all production of acetylene and aromatics still comes from coal. There is also one potential but undeveloped method of supply of petroleum raw materials — the import in re-

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300 lb. Alloyco Stainless Steel Gate Valves

Figure 2117
double disc. (above)
Available in sizes ½" to 8".
Figure 2217 for solid wedge.
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In addition — screwed, and socket weld ends.
Sizes ½" to 2".
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swing and lift checks; jacketed and tank valves.
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Alloyco 20
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Hastelloy alloys
B and C

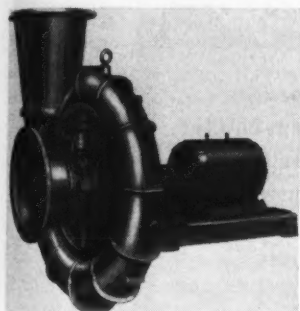
For more information on Alloyco valves for your specific corrosive service, write for Bulletin #7 to Alloy Steel Products Company, 1301 West Elizabeth Ave., Linden, New Jersey... the one manufacturer specializing in Stainless Steel Valves exclusively.



ALLOY STEEL PRODUCTS COMPANY
Linden, New Jersey

Check 4164 opposite last page
CHEMICAL PROCESSING

refrigerated tankers of liquefied C_1 to C_4 hydrocarbons. The next 5-10 years should show whether economic progress can be made in these directions. If so, petrochemical activities in the U.K. will be as comprehensive as in any country in the world.



Single-stage compressors for petrochemical, refinery uses

Uses: Line of centrifugal compressors was designed specifically for refinery and petrochemical applications. Units can be used for blower service where inlet conditions are atmospheric; for exhaust service where inlet conditions are below atmospheric pressure; or for booster service where inlet conditions are above atmospheric pressure.

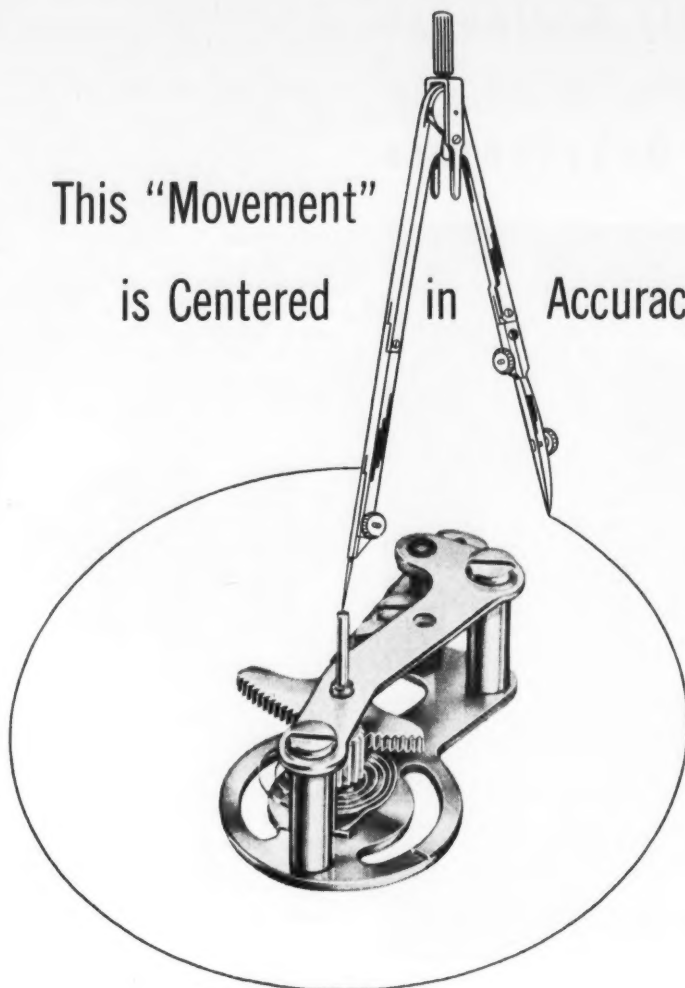
Features: Units have heavy duty cases; overhung rotor construction; single shaft seal design; open or closed type impellers to meet various pressure and temperature requirements.

Description: Of simple design, single-stage centrifugals are essentially constant pressure, variable volume machines. Sizes cover the 1200 to 80,000 cfm range with input horsepower from 10 to 2500 bhp. Discharge pressures up to 900 psig can be readily handled in the lower capacity models.

(Type OM and OPB single-stage compressors are a product of Clark Bros. Co., One of the Dresser Industries, Olean, New York.)

Check 4165 opposite last page.

This "Movement"
is Centered in Accuracy



The rotary movement in Ashcroft Duragauges has a geared center shaft on which the pointer is mounted. When pressure flexes the Bourdon tube, the pointer is always positively positioned. You can rely on the Duragauge for precise accuracy in measuring pressure no matter how severe the conditions of service.

Correct calibration is guaranteed: the one-piece link between movement and Bourdon tube prevents slippage or parting under tension. Recalibration is easy from front or rear. Universal adjustability permits uniformly graduated dials.

You can order Ashcroft Duragauges with all-stainless-steel movement or stainless steel with nylon bearings and pinion gear. A complete choice of Bourdon tube materials, pressure ranges, dial sizes and case designs and materials is available. Your industrial supply distributor will gladly help you select the best combination for your requirements. So, be certain of highest sustained accuracy, durability and economy — specify Ashcroft Duragauges.



Ashcroft Duragauge in AlumaLife® case—a lifetime case made of special aluminum alloy.



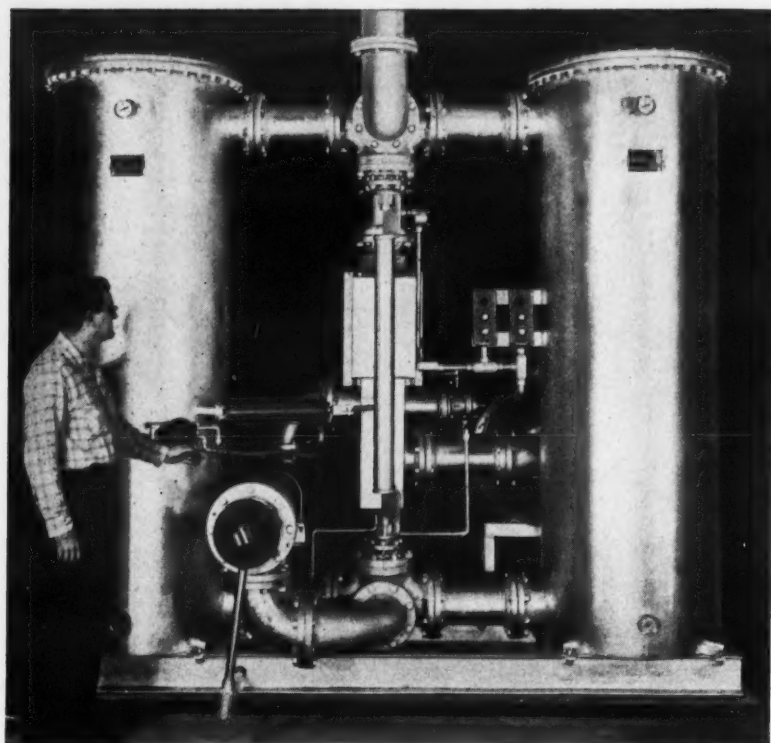
ASHCROFT PRESSURE GAUGES

A product of
MANNING, MAXWELL & MOORE, INC.

Consolidated Ashcroft Hancock Division • Stratford, Connecticut
In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario

Check 4166 opposite last page

Continuous, Automatic Drying of Compressed Air, Process Gases and Liquids with Selas Dehydrators



LOW PRESSURE DEHYDRATOR for continuous drying of furnace atmosphere and low pressure process gases. Closed-cycle reactivation is utilized, preventing contamination of the process gases with air or other diluents.

Selas offers a standard line of steam and electric reactivated Dehydrators . . . **internal** (with the heater imbedded in any commercial desiccant for low equipment cost) . . . **external** (where more positive reactivation heat control is desired). Selas Dehydrators are available in low pressure series and high pressure series to handle compressed gases.

In addition to the standard line, Selas custom-builds units for large volumes, special conditions, extreme pressures and unusually low dewpoints.

Send for descriptive Bulletin 143 illustrating complete line of Selas Dehydrators.

SELAS Heat and Fluid Processing Engineers
CORPORATION OF AMERICA
DREXEL, PENNSYLVANIA
DEVELOPMENT • DESIGN • CONSTRUCTION



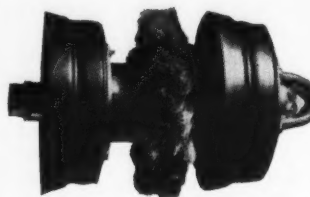
Check 4167 opposite last page

PETROCHEMICALS

Clean underground line 16,200' in length

Permits safe use in liquid oxygen service

Problem: Organic polymerized deposits had to be removed from a 16,200' underground line before it could be safely used for transferring liquid oxygen from one plant to another. The 6"-diameter, welded line had been used in



Pig is forced through line to assist cleaning solutions in removing deposits

acetylene service for a number of years, which had caused the buildup on the inside. Unless the line was cleaned thoroughly, liquid oxygen might react with the organic deposits and result in an explosion.

Solution: Cleaning was accomplished by pumping alternate stages of different solutions through the line, separated by "pigs." These pigs are mechanical contrivances, consisting of rubber discs and steel-wire brushes, which are forced through line by pressure. By their scraping and wiping action, they assist the cleaning solutions in removing deposits clinging to pipe walls.

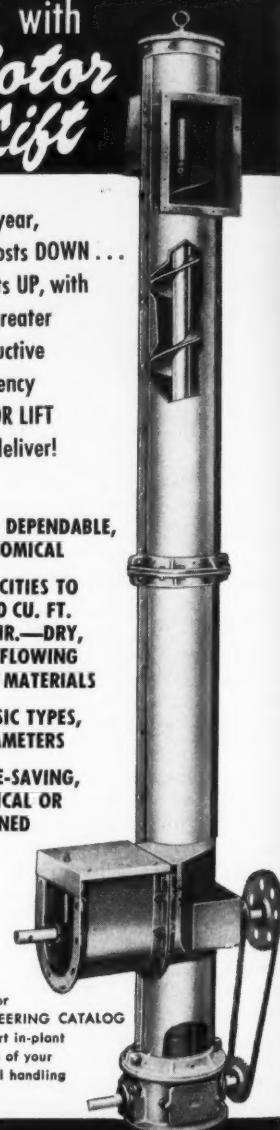
A special feed-in line, containing a manifold for introducing the pigs was hooked onto the line at one end. A "pig-trap" was placed at the other end. Hydrochloric acid and caustic solutions were alternately forced through the line with the brushes. Pumping rate was approximately 200 gpm. Spent solutions at the exit end of the line were collected in tank trucks and hauled off to waste. Alkaline stages, containing special oxidizing agents, were designed to attack and remove the polymerized organic deposits. Acid stages were designed to

IN '59 MODERNIZE for GROWTH and PROFITS with Rotor Lift

This year, get costs DOWN . . . profits UP, with the greater productive efficiency **ROTOR LIFT** can deliver!

- SAFE, DEPENDABLE, ECONOMICAL
- CAPACITIES TO 6,000 CU. FT. PER HR.—DRY, FREE-FLOWING BULK MATERIALS
- 8 BASIC TYPES, 4 DIAMETERS
- SPACE-SAVING, VERTICAL OR INCLINED

Write for ENGINEERING CATALOG or expert in-plant analysis of your material handling needs!



World's Largest Manufacturer of Vertical Helical Screw Elevators

SOUTHWESTERN
SUPPLY and MACHINE WORKS
OKLAHOMA CITY, OKLAHOMA

Check 4168 opposite last page
CHEMICAL PROCESSING

dissolve and remove any inorganic oxides or rust deposits in the line.

After acid and alkaline cleaning, line was flushed with water. Then a special passivating solution, designed to prevent after-rusting which might occur if freshly cleaned metal were exposed to air, was introduced in line. As a further insurance against any rusting taking place, this passivating solution was purged from the line with nitrogen gas. In all, 24 passes through the line were made with the mechanical pigs.

Results: Cleaning job was completely successful. Although it was impossible to make a complete inspection of line, evidence indicates that all organic deposits were entirely removed and that the line is metal-clean. Liquid oxygen is now being transferred through line without hazard.

(Cleaning service was performed by Dowell Div., The Dow Chemical Company, PO Box 536, Tulsa, Okla.)

Check 4169 opposite last page.

Terephthalic acid process now in operation in Japan

Liquid-phase, air-oxidation process for manufacture of terephthalic acid from petroleum-based feedstocks is now in operation for Mitsui Petrochemical Industries, Ltd., at Iwakuni City, Japan.

Terephthalic acid plant is another unit of Mitsui's \$30-million petrochemical project which includes ethylene glycol, cumene by alkylation of benzene with propylene, and para-xylene.

(Plant was designed by Scientific Design Company Inc., 2 Park Avenue, New York 16, New York.)

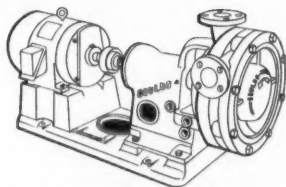
Check 4170 opposite last page.

Reducing valve is depicted in catalog sheet which includes drawing and dimensions. "No 1910 Type E Pressure Reducing Valve" — Atlas Valve Company, 280 South Street, Newark 5, N.J.

Check 4171 opposite last page.



IS THIS HAPPENING INSIDE YOUR PUMPS?



The Goulds-Pfaunder glassed pump is available in conventional hydraulic design, simplifying installation and maintenance. Four sizes with capacities up to 700 GPM, heads up to 140 ft.

When you pump corrosives, the inside of your pump can look like this. Or . . .

You can pump corrosives *without* corrosion with the Goulds-Pfaunder Fig. 3708 glassed pump. Every surface that comes in contact with the pumpage is protected by tough borosilicate glass fused permanently to the metal!

This glass-to-metal bond resists most acids at temperatures up to 350°F and alkalis at moderate temperatures.

You also prevent loss of product due to contamination, since glass is *inert*. Glass is *smooth* — discourages product adhesion and scale build-up.

For all the details, write for Bulletin 725.2 . . . plus a second booklet, "It's What's Inside That Counts," that gives you the inside story behind the new Goulds-Pfaunder glassed pump. Write Goulds Pumps Inc., Dept. CP-39, Seneca Falls, New York.

GOULDS  PUMPS

Check 4172 opposite last page

WANT TO KEEP A WAREHOUSE

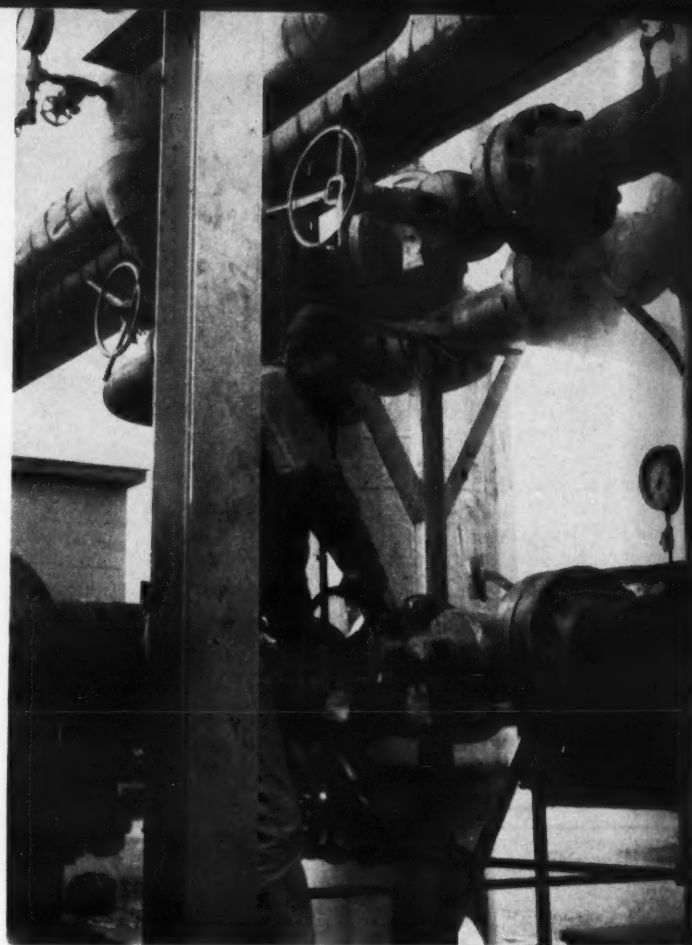
DESERT-DRY? Then get Lectrodryer: costs you less because it's engineered to give you more. Dry warehousing safeguards your investment. Dry-stored materials stay like new, often need no other protection. They're ready for use on a moment's notice. Don't let moisture slow your production, impair product quality, cost you money. Control relative humidity with a Lectrodryer, engineered to your exacting needs. Continuous or intermittent operation. Packaged. Steam, gas or electric reactivation. Backed by 27 years' manufacturing and application experience. For DRYing facts contact Pittsburgh Lectrodryer Division, McGraw-Edison Company, 352 32nd Street, Pittsburgh 30, Pennsylvania.



Lectrodryer®

McGraw-Edison

Check 4173 opposite last page



Photos by CP Staff

In addition to giving trouble-free service with air at 650 psi and ammonia at 300 psi, Teflon-packed forged-steel valves, which use no oil lubricant to create possible hazard . . .

Handle Oxygen Safely at 410 PSI

GORDON WEYERMULLER
Petrochemical Editor
with **IRVING C. ROTH**
Administrative Assistant
Cooperative Farm Chemicals Assn.
Lawrence, Kansas

three, oxygen is probably the hardest material to handle since it is potentially the most hazardous.

Oxygen

Integral forced-steel valves, with a ball-type seating core and round through-port are being successfully used on three services at Cooperative Farm Chemicals — oxygen, air, and ammonia. Of these

Two of the forged-steel valves of 2" size were installed early in 1958 in line transporting pure oxygen to synthesis-gas generation plant. These valves are doing an excellent job. Since they are

PETROCHEMICALS

Forged-steel valves on air service at 650 psi and 65°F

One of forged steel valves on oxygen service



non-lubricated, no oil is present to create a possible hazard with oxygen. Teflon packing used is inert to oxygen. These valves operate at 410 psi and 250°F.

Air

Four 6 x 4" Venturi-pattern forged-steel valves are used on air service at the plant. These are used in connection with a pair of Pritchard Dryer used for drying air. These valves operate at 650 psi and 65°F.

Principal advantage of valves for air service is that leakage is eliminated. With a conventional gate valve, the small amount of dust in air gets behind wedges and causes leakage. Forged-steel valve is constructed so that ball contacts seat only at closure. Dust cannot get between seats because valve is self-cleaning and dust carryover is swept through valve by air streams. These units also went into service in early 1958.

Ammonia

Two of these forged-steel valves with stainless trim — Venturi; 3 x 2½" — are being used successfully in ammonia plant at 300 psi. Absence of lubricant eliminates possible contamination of ammonia from this source. Positive shutoff prevents leakage. Resilient seat compensates for

wear and it wears evenly all around. No problems have been encountered with these valves since placed in service in early 1958.

A 2" forged-steel valve with stainless trim has been used on ammonia loading rack at 180 psi for about a year. One more 3" valve is just going into service now on a let-down drum. It will be used to transfer ammonia from let-down drum to storage tanks.

Design of Valves

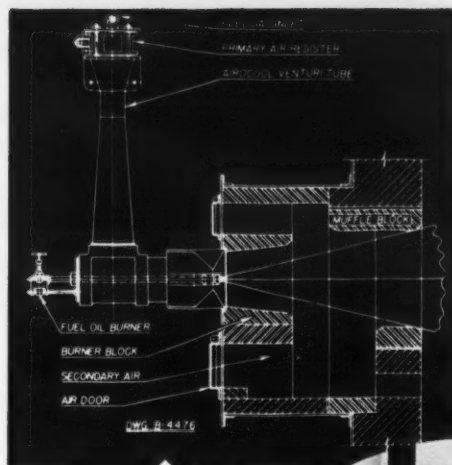
Forged-steel valves have an all-steel body and bonnet welded together as though to form a pressure vessel.

Valve has a friction-free seating principle which utilizes resilient seating with attendant metal-to-metal closure. A segment of semi-spherical seat core is hard-faced and ground to present a spherical seating face to resilient body seat. Stem cam rocks the setting core on or off seat in opening or closing. Seating ball makes quarter-turn to open or close valve.

Smooth and easy closing, facilitated by the friction-free seating principle employed in these valves, is an advantage at the Cooperative Farm Chemicals plant.

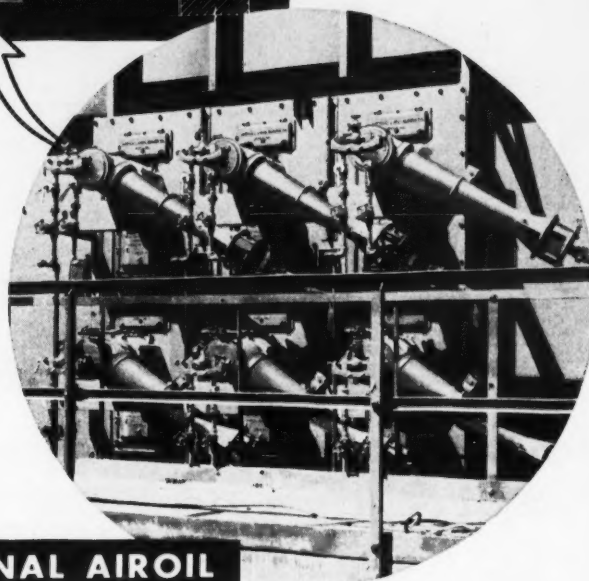
(Forged-steel valves are product of Orbit Valve Co., PO Box 699, Tulsa, Okla.)

Check 4174 opposite last page.



Firing

CRUDE DISTILLATION UNIT HAVING WORLD'S HIGHEST THRUPUT...



NATIONAL AIROIL

OIL-GAS TANDEM COMBUSTION UNITS

Looming large in the effort to meet increased products demand on the petroleum industry is Tidewater Oil Company's ultra-modern Delaware Refinery, for which C. F. Braun & Co. were the engineers and constructors.

At the Tidewater Oil Company's ultra-modern Delaware City refinery this huge crude furnace for a world's record capacity of 130,000 barrels per day is equipped with National Airoil Burner Company's exclusive Tandem Block Combustion Units which are easily capable of exceeding the designed capacity of the furnace when burning either liquid or gaseous fuels.

These Tandem Units will burn up to high viscosity residuum oils and/or varying molecular weights of refinery gases. They have high individual heat liberating capacity as well as turn down ratio on natural draft thus avoiding the cost of a blower system. They will operate with low excess air.

Because these high combustion efficiency Tandem Units liberate a large proportion of heat by flame radiation to the heat absorbing surfaces, they increase the days on stream by reducing flame impingement with its accompanying high maintenance cost to tubes, brick work, etc.

National Airoil

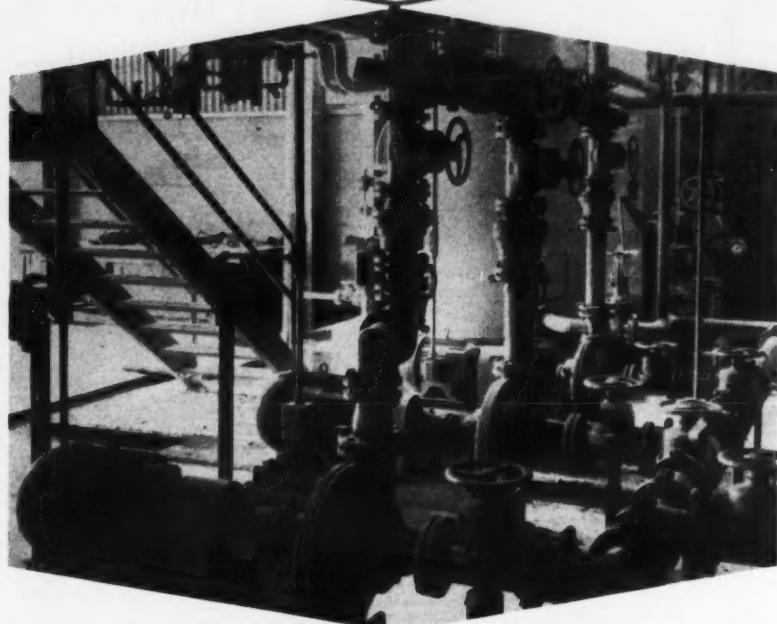
BURNER COMPANY, INC.

Main Office & Factory: 1300 EAST SEDGLEY AVE., PHILADELPHIA 34, PA.

SOUTHWESTERN DIVISION: 2512 SOUTH BOULEVARD, HOUSTON 6, TEXAS

Check 4175 opposite last page

ONLY DORR-OLIVER MAKES
3 DIFFERENT PUMP TYPES
for complete chemical coverage



how Goodyear handles corrosive liquids with **OLIVITE** acid handling pumps

At the Goodyear synthetic rubber plant at Houston, Texas, the two Olivite pumps photographed above give excellent performance in a corrosive application. The larger 4" pump handles 350 gpm of mother liquid containing about 4% by weight brine and .25% sulphuric acid from the shaker screen located between the rubber crumb soap conversion and reslurry tanks. The smaller 2" pump handles 70 gpm of .5% dilute sulphuric acid. Mother liquid and acid are combined for charging to the rubber crumb coagulation tank. TDH for both pumps is 110'.

Casings and impellers of Olivite acid handling pumps are protected against corrosion by a covering of synthetic rubber. Behind them stand the specialized knowledge and experience of Dorr-Oliver—the only manufacturer offering three distinctly different pumps for complete coverage of all needs of the chemical processing industries. For complete information, write Dorr-Oliver Incorporated, Stamford, Conn.



OLIVITE—Reg. T.M. Dorr-Oliver Incorporated

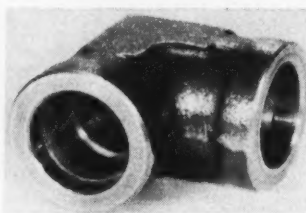
Check 4176 opposite last page

PETROCHEMICALS

**Tensile strength
of tube fittings—
130,000 psi**

Uses: For tubing joints in high pressure service and other critical applications in petrochemical and refinery services.

Features: Joint strengths up to 130,000 psi in tensile strength and 48,000 psi in shear can be obtained in alloy



Elbow showing silver brazing alloy ring pre-positioned within tapered socket of fitting

steel. Fitting will withstand mechanical, chemical, or thermal loads.

Description: Tube connection has a 3-position silver alloy brazing ring. Tube is simply inserted into the fitting. Heat applied to the fitting produces a permanent liquid-tight, gas-tight joint. Tapered socket of fitting aligns and holds the tube. The fittings are made in all commonly used body shapes for tubing of 1/4 through 2" outside diameter. They can be furnished in steel, stainless steel, naval brass, cupronickel or other materials.

(Braze-lok tube fittings is a product of Parker Fittings & Hose Div., Parker-Hannifin Corp., 17325 Euclid Ave., Cleveland 12, Ohio.)

Check 4177 opposite last page.

Entrainment separators of wire mesh are delineated in eight-page bulletin that includes data on mesh and grid construction and vapor-velocity graphs. Bul ME-9—Metal Textile Corporation, Roselle, N.J.

Check 4178 opposite last page.

Modernization ideas from manufacturer are discussed in 20-page booklet, "59 Ideas For Modernization In '59"—Allis-Chalmers Manufacturing Company, Box 512, Milwaukee 1, Wis.

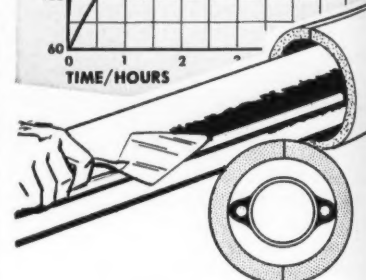
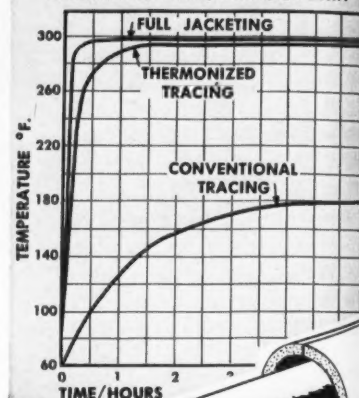
Check 4179 opposite last page.

HAVE YOU TRIED



Thoroughly proved
HEAT TRANSFER MEDIUM
now effecting savings up to
90% for over 700 users!

COMPARATIVE HEAT TRANSFER DATA



Thermon is a non-metallic plastic compound with highly efficient heat transfer properties, and is easily applied over either steam traced or electrical resistance systems . . . working equally well for either heating or cooling processes.

Thermonizing has excellent heat transfer characteristics (see curves), exceeding steam traced equipment approximately 1100%, and closely approaching jacketing equipment. Thermon can be used almost without exception in place of expensive jacketing (and in many applications where jacketing is impossible), with savings up to 90%.

Write for complete technical literature on revolutionary Thermon!



**THERMON
MANUFACTURING CO.**

1017 Rosine • P. O. Box 1961
Houston, Texas

Check 4180 opposite last page

CHEMICAL PROCESSING

Rapid ion collection stops capricious base line in chromatography

System permits sensitivity to small concentrations

Uses: For automatic separation, identification, and permanent recording of different substances in gases and liquids. System can be used by petroleum, drug, chemical, and food industries.

Features: Superior sensitivity to smaller concentrations given by rapid ion collection (within 10^{-3} or 10^{-2} seconds). System is relatively insensitive to changes in gas flow, temperature, and pressure, thus eliminating wandering base-line problem.

Description: Argon is used as carrier in permanent unit. Samples are normally intro-

duced with calibrated glass capillary tube. Analyst then closes column and opens argon tank to proper pressure and flow rate.

amplified to operate strip-chart recorder having two-second, full-scale pen movement. Analyst calculates percentage composition by components of sample.

Increased sensitivity eliminates need for long columns to attain difficult separations. Both column and detector compartments are independently housed and have individual temperature-control systems.

Automatic proportional controller, containing set of cascading, saturable-core reactors, is used to maintain temperature within $\pm 0.01^\circ\text{C}$. Optional cooling system provides cooling rate of 3 to 7°C per minute for column compartment.

Available integrator gives counting rates up to 2400 pips per minute. Indicator provided has 5" scale (5° to division) with selector switch permitting reading of temperatures of column, detector, and flash heater.

System is available in two models. Permanent system is capable of either single- or dual-column operations using glass, metal, or capillary columns. Portable unit, particularly designed for petrochemical field, uses capillary tubes.

(Gas-liquid chromatographic ionization detection systems, Models 10 (permanent) and 20 (portable), are products of Wheelco Instruments Division, Barber-Colman Company, Rockford, Illinois.)

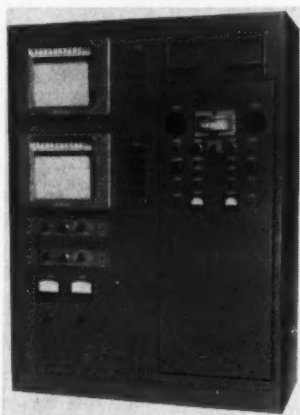
Check 4181 opposite last page.

Instrumentation systems are discussed and compared in 12-page brochure, "The Application of Innovation in Engineering Systems" — The M. W. Kellogg Company, Subsidiary of Pullman Incorporated, 711 Third Avenue, New York 17, N.Y.

Check 4182 opposite last page.

NEXT MONTH

U. S. and World PETROCHEMICALS will carry a feature article telling how double-sealed ball valves are being successfully used on propane at pressures up to 600 psi.



Permanent, gas-liquid chromatographic-ionization detection system with two complete assemblies in single cabinet

duced with calibrated glass capillary tube. Analyst then closes column and opens argon tank to proper pressure and flow rate.

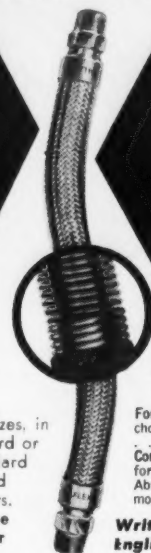
As sample is converted to gas by contact with heated chromatograph column, it is absorbed by liquid-phase coating on sand in tube. Time for substances to exit from column, enter detector, and be recorded is retention time.

Ionization current is amplified by radioactive source consisting of radium material on thin metal-foil wafer inside detector block. Current is

NOW Allflex "MNH" FLEXIBLE CONNECTORS

FROM STOCK FOR FASTEST SERVICE

• STAINLESS STEEL
• BRONZE
• MONEL



THESE STOCK SIZES

$\frac{1}{4}$ " $\frac{3}{8}$ " $\frac{1}{2}$ " $\frac{3}{4}$ "
1" $1\frac{1}{4}$ " $1\frac{1}{2}$ " 2"

IN THESE STOCK LENGTHS

12" 18" 24" 30"
36" 48" 60" 6Ft.
8Ft. 10Ft. 12Ft. 15Ft.

... also available in all standard sizes, in any required length, with any standard or special fitting or flange. Allflex Standard "MNH" Flexible Connectors are sold through leading Industrial Distributors. If not available locally — they can be shipped from factory same day order is received.

Allied's new "MNH" in-stock plan assures you same-day shipment of the most popular standard "MNH" Flexible Connectors.

• No more delays while your unit is custom-built.

For the first time, you have an unequalled choice of standard "MNH" sizes and lengths in-stock at all times. "MNH" Flexible Connectors: Dampen Vibration, Compensate for Misalignment, Permit Offset Movement, Absorb Expansion, Allow "travel". Handle most flexing applications.

Write today for fact-filled Allflex Engineering Data Sheet.

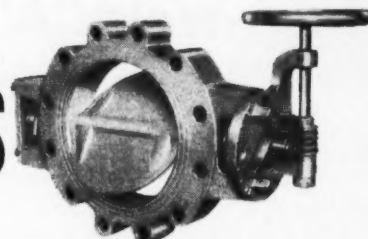
ALLIED METAL HOSE COMPANY
3784 Ninth St., Long Island City 1, N.Y. Stillwell 4-5173

Check 4183 opposite last page

ROCKWELL

"WAFFER" VALVES

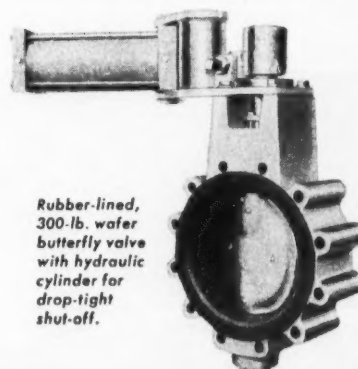
- LOWER IN FIRST COST
- NEED MINIMUM SPACE
- EASY TO OPERATE



Standard 125-150 lb. wafer butterfly valve with handwheel; also available with lever control or mechanical operators.

For controlled throttling or tight shut-off of air, gases, process fluids or semi-solids, Rockwell Wafer Butterfly Valves offer the advantages of rugged construction, compactness, small face-to-face dimension to fit in minimum clearance between pipe flanges.

Write for Bulletin 580.



Rubber-lined, 300-lb. wafer butterfly valve with hydraulic cylinder for drop-tight shut-off.



W. S. ROCKWELL COMPANY

Valves - Butterfly - Slide - Diaphragm - Special

2209 ELIOT STREET • FAIRFIELD, CONN.

Check 4184 opposite last page



Inco-Weld "A" Electrode joins high-strength low-alloy steel and 304 stainless, in 45 ft by

12 ft diameter pressure chamber. Fabricated by O. G. Kelley and Co., Boston, Mass.

Inco-Weld "A" joins most dissimilar alloys in nuclear applications, too

The 4 welders above are all using Inco-Weld* "A" Electrode. They're welding high-strength low-alloy steel and 304 stainless on a 160-ton nuclear components testing chamber.

Two other popular electrodes failed on test welds for this job . . . weld metal cracked from differing thermal expansion rates between the dissimilar metals joined.

Inco-Weld "A" Electrode solved this problem . . . produced X-ray quality weld throughout; with corrosion resistance equal to parent metal.

Better than 97% of all weldable dissimilar alloys can be joined with both Inco-Weld "A" Electrode and Inco-Weld "A" Wire. You don't need any special equipment or training to get sound, strong, corrosion-resisting welds.

Useful new booklet "Now You Can Weld Dissimilar Alloys Quickly and Easily" includes actual cases of problem welds solved; costs reduced; with Inco-Weld "A" Electrode and Wire.

*Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.



**MIG or TIG-Weld
dissimilar alloy combinations
with Inco-Weld "A" Wire.**

You get all the advantages of Inco-Weld "A" Electrode plus an age-hardenable deposit. Available in spools and cut lengths.

INCO WELDING PRODUCTS

electrodes • wires • fluxes

Check 4185 opposite last page

PETROCHEMICALS

**Hydraulic remote control
is manually operated,
self-lubricating**

Temperature compensation
assures synchronization

Uses: Remote control of valves, clutches, and transmissions in refineries, petrochemical plants, gasoline plants, and compressor stations. Can be used up to 100 ft away.

Features: System automatically compensates for expansion and contraction of hydraulic fluid due to temperature variations. This results in synchronization between slave and master unit.

Description: Self-contained, manually operated hydraulic remote-control system consists of master control hydraulically coupled to slave cylinder. Slave cylinder is available with either lever-type or push-pull-type arm. Former transmits 500 in-lb through 114" in either direction. Latter transmits 1000 in-lb through one-inch stroke in either direction.

Self-lubricating system operates in temperature range from -65 to 250°F. It can be safely used in areas exposed to explosive fumes.

(Hydraulic remote-control system is a product of The Hydronic Corporation, 12685 Arnold Avenue, Detroit 39, Michigan.)

Check 4186 opposite last page.

Engineering facilities, in addition to those of manufacturing and research, of company are presented in 24-page booklet. "A Presentation of Facilities" — The Pfaudler Co., Division of Pfaudler Permutit Inc., 1080 West Avenue, Rochester, N. Y.

Check 4187 opposite last page.

Insulating and refractory material, called Foamsil, is described in four-page bulletin. Material is unaffected by practically all common acids or by thermal shock. Material is made from 99% pure fused silica, product has a practical operating range of -450 to 2200°F. Bul FS-1 — Pittsburgh Corning Corporation, 1 Gateway Center, Pittsburgh 22, Pa.

Check 4188 opposite last page.

CHEMICAL PROCESSING

U.S.I. CHEMICAL NEWS

★

A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries

★

Polyethylene Properties Of Great Value to Labs Handling Radioisotopes

Polyethylene's properties of radiation-resistance, chemical inertness and physical toughness are proving invaluable to a fast-growing group of chemists and engineers who work with radioactive isotopes in the laboratory.

Contamination—its prevention and elimination—is of course the greatest concern of those who work with radioactive materials. Polyethylene reduces the problem in a number of ways. It is nonionic—will not pick up or transmit stray ions readily. It is nonporous and chemically inert—so can be cleaned easily. Polyethylene containers, equipment and furnishings are generally one-piece moldings—eliminating cracks and joints which might trap radioactive particles.

A highly radiation-resistant material, polyethylene can take doses up to six megaroentgens without degradation. In fact, low doses of radiation have been used to improve the heat resistance of this plastic. Polyethylene has even been employed as a secondary shielding for neutrons which penetrate lead.

Polyethylene makers are looking forward to a fast-growing market for their products in the lab—and perhaps even in the plant—as radioactive materials become increasingly available for industrial use.

New Safety Data Sheet Out on Phosphoric Acid

Properties and safe-handling practices for phosphoric acid have been compiled in a new safety reference booklet now available from MCA at nominal cost. The 14-page booklet covers hazards and their control, employee safety, fire fighting, handling and storage, equipment cleaning and repairing, waste disposal, health measures and first aid.

As a producer of wet process phosphoric acid, U.S.I. can supply further data on individual safety requirements for specific uses.

Zirconium Valve Stems Prove Ideal for Acid Service at Mallory-Sharon

After 14 months in acid service, 40 zirconium-stemmed control valves are still operating without a single stem failure at the Mallory-Sharon zirconium plant, Ashtabula, Ohio.

The valves are used in all concentrations of hydrochloric and sulfuric acids, raffinate, acidified hexone, solutions of ammonium thiocyanate and thiocyanic acid, and other solutions. Mallory-Sharon engineers say they have proved excellent in every way—requiring very little maintenance or operator attention.

Designed by an instrument engineer at U.S.I. (one-third owner of Mallory-Sharon Metals), the valves were custom-fabricated

MORE

Finely-Divided Sodium Lowers Costs, Improves Yields in Broad Range of Chemical Reactions

Many New Products, New Processes Made Possible Through Development of Finely-Divided Sodium Techniques.

Sodium in the form of dispersions is offering important advantages in many chemical processes today. It provides a reliable mechanism for controlling reaction speed. It makes possible the addition of immediately available sodium at a desired rate, thereby giving better control of reaction conditions. Many chemicals can now be produced in larger yields, in shorter time and at lower cost than has been possible with other materials or other methods.

Use of Chemical Milling Grows in Metalworking

Many metalworkers are now using chemicals to etch out complex metal shapes to very close tolerances. Large amounts of metal over wide areas, to a depth of about one inch maximum, can be removed economically by this technique on jobs where conventional machining operations would be difficult and costly, or sometimes impossible.

First the entire metal part is coated with a masking compound and allowed to dry. Using a sharp-bladed knife to cut through the cured mask, and a suitable template to guide the knife, the design is transferred to the part. The mask is then peeled from those areas to be chemically milled, and the part is dipped in or sprayed with a chemical solution to etch away the unmasked areas. Caustic soda is one of the major constituents in the etchant to mill aluminum. Magnesium, titanium and stainless steel are chemically milled in acid mixtures which typically are blends of sulfuric, nitric, hydrochloric and hydrofluoric acids.

Chemical milling has been applied successfully on a mass production basis to aluminum, magnesium, titanium, mag-thorium, Inconels, Monels, carbon steels and steel superalloys. It is used widely in the aircraft and missile fields where great weight savings can be achieved over machine milling. Both castings and forgings have been shaped by chemical means. Electronic circuits, steel shipping containers, pump impellers, radar aerials and decorative paneling are among the products outside the aviation field to which chemical milling has been applied.

Sodium Coolant from Reactors Studied for Use In Radiation Processing

The Atomic Energy Commission has contracted for a feasibility study on using the sodium reactor coolant at the Hallam Nuclear Power Facility as a high-level radiation source for industrial processing. The study will investigate the technical feasibility of using the radioactive sodium coolant for industrial radiation processing and of integrating such a radiation processing plant with the nuclear power facility being built at Hallam, Nebraska. Included will be a preliminary design study for the radiation processing plant.

Dispersions for Claisen Condensation

In Claisen condensation reactions, sodium dispersions give high yields and fast reaction rates in the production of such compounds as ethylacetoacetate, ethylbenzoylacetate and ethylsodiumoxalacetate. In the condensation of ethylacetate to ethylacetoacetate, for example, a combination of highly dispersed sodium and increased temperature gives practically quantitative yields of acetoacetic ester, based on sodium. The use of this technique eliminates the time-consuming preparation of sodium ethylate.

Organosodium Compounds

Finely-divided sodium now offers a simple, economical route to many old and new compounds of the organosodium type (containing direct carbon-to-sodium bond). These compounds are obtained by halogen replacement, hydrogen substitution or addition.

Using halogen replacement,

MORE



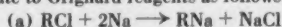
Commercial reactions using sodium dispersions are run in conventional equipment like this jacketed kettle.

U.S.I. CHEMICAL NEWS

CONTINUED

Sodium

the U.S.I. laboratories have developed a new route to Grignard reagents as follows:



Sodium is a less expensive starting material than magnesium, and less hazardous hydrocarbons can be substituted for ether as a solvent. In addition, higher yields are obtained with the sodium process.

Another halogen replacement reaction employs chlorobenzene in a sodium dispersion to yield phenylsodium, which can be reacted with toluene in a hydrogen substitution reaction to give benzylsodium. Phenylsodium, benzylsodium and many other organosodium compounds can be reacted with metallic halides such as $AlCl_3$, BCl_3 , etc. to yield corresponding organometallic compounds.

Further details on the syntheses possible with organosodium compounds are given in U.S.I.'s free booklet "Sodium Dispersions".

Other Uses for Sodium Dispersions

A suspension of sodium hydride in mineral oil is easily produced by treating a sodium dispersion with hydrogen gas at 250-325°C and 200-500 psi hydrogen pressure.

Sodium dispersions are used to reduce nitriles to amines, ketones to alcohols, metal halides to finely-divided metals, esters to acylolins. They are employed to prepare sodamide and sodium acetylide. These reactions represent only a portion of the possible applications for sodium in finely-divided form.

Sodium Removes Impurities

Finely-divided forms of sodium are also being used to remove impurities from petroleum fractions and other hydrocarbons that do not possess conjugated double bonds. For example, coke oven producers of benzene, toluene and xylene are finding it difficult to compete with corresponding petroleum-based materials in so far as purity is concerned. Particularly, thiophene content is too high. However, by means of a novel U.S.I. process, coke oven aromatics can now be desulfurized with finely-divided sodium.

CONTINUED

Zirconium

using zirconium sponge from U.S.I.'s own pilot plant—forerunner of the present Mallory-Sharon installation.

In this instance, of course, initial zirconium cost was not a factor. However, the extremely long service life of the material, and the freedom from maintenance problems, bear out Mallory-Sharon's contention that zirconium is very economical over the long pull in applications where lower-priced metals just do not stand up.

In the recent past, zirconium has been a costly material and its availability for industrial applications has been limited. Now, with a million pounds per year of the metal available to industry from the Mallory-Sharon plant alone, costs are continually being reduced. It is possible to foresee fabrication of zirconium parts at costs only 3 to 5 times higher than for equivalent parts in stainless steel. In most cases, improved performance with zirconium will much more than offset the cost differential.



After 14 months in acid service, zirconium-stemmed control valve still operates at Mallory-Sharon zirconium plant, Ashtabula, Ohio.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

New bottle carrier of heavy-wall polyethylene, designed for safe intra-plant transport of one-gallon bottles of corrosive chemicals and solvents, is now on market. Carrier solid to prevent breakage, also to contain bottle contents. **No. 1440**

Eight longer-lived radioactive isotope standards, supplied until now by the National Bureau of Standards only, are available commercially. They are cesium-137, cobalt-60, iron-59, radium D+E, strontium-90, sulfur-35, tantalum-182 and thallium-204. **No. 1441**

New ultracentrifuge auxiliary permits separation, identification and characterization of materials up to 120° or down to 0°C. Broadens ultracentrifuge use in fields where solutes are not soluble enough at normal temperatures. **No. 1442**

Diphenyldidodecylsilane can now be obtained in limited commercial quantities as a new hydraulic fluid for systems subject to temperature and environmental extremes. Claimed to have good lubricating properties. **No. 1443**

Series of data sheets on tank truck shipment of liquid chemicals is now being sold. 35 sheets now available, each on a different chemical, give data on suggested equipment, loading, handling, safety, clean-up, etc. **No. 1444**

Over 200 organo-metallic compounds are cataloged in new brochure now available. Listed by main constituent such as boron, tin. Physical constants given for research chemicals, specs and uses given for commercial chemicals. **No. 1445**

170 Standards for fire safety are compiled in new, 6-volume, 1958 edition of National Fire Codes, now being sold. Includes 38 new or revised standards. Volumes on fluids, solids, buildings, extinguishers, electrical, transport. **No. 1446**

Non-flammable phosphoric acid type cleaner for most metals has been developed. Said to remove rust, metal oxides, oil and grease rapidly in one simple operation. Leaves light phosphate film on steel and zinc. Can be used hot or cold. **No. 1447**

New boron analyzer, designed to measure boron content of liquid process streams continuously to $\pm 1\%$ by volume, is now on market. Detects B^{10} isotope of boron, works on neutron absorption principle. **No. 1448**

Tracer applications for study of organic reactions are discussed in new book now being sold. Intended to stimulate use of isotopes among organic chemists. Appendices list texts on isotope use, organic reaction mechanisms. **No. 1449**

PRODUCTS OF U.S.I.

HEAVY CHEMICALS

Sodium, Metallic: cast solid in tank cars, steel drums, pails; bricks in barrels, pails.

Sodium Peroxide, Sodium Sulfite, Sodium Sulfate

Ammonia, Anhydrous: commercial & refrigeration. Tank cars or tank wagons.

Ammonium Nitrate, Nitric Acid, Nitrogen Fertilizer Solutions

Phosphatic Fertilizer Solutions: wet process phosphoric acid.

Sulfuric Acid: all strengths, 60 Baume to 40% Oleum. Also Electrolytic grade to Federal specifications. Tank cars or tank wagons.

Caustic Soda, Chlorine

OTHER PRODUCTS

PETROTHENE® Polyethylene Resins

Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Urethan USP, Riboflavin USP, Intermediates.

Alcohols: Ethyl (pure and all denatured formulas); Proprietary Denatured Alcohol Solvents SOLOX®, FILMEX®, ANSOL® M, ANSOL® PR.

Organic Solvents and Intermediates: Normal Butyl Alcohol, Amyl Alcohol, Fusel Oil, Ethyl Acetate, Normal Butyl Acetate, Diethyl Carbonate, DIATOL®, Diethyl Oxalate, Ethyl Ether, Acetone, Acetoacetanilide, Acetoacetyl-Ortho-Chloranilide, Acetoacetyl-Ortho-Toluidide, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Sodium Oxalacetate, Sodium Ethylate, ISOSEBACIC® Acid, Sebacic Acid, Urethan U.S.P. (Ethyl Carbamate), Riboflavin U.S.P., Pelargonic Acid, 2-Ethyl Heptanoic Acid.

Animal Feed Products: Antibiotic Feed Supplements, BHT Products (Antioxidant), Calcium Pantothenate, Choline Chloride, CURBAY® B-G®, Special Liquid CURBAY, VACATONE®, Menadione (Vitamin K₃), DL-Methionine, MOREA® Premix, Niacin USP, Riboflavin Products, Special Mixes, U.S.I. Pernadry, Vitamin B₁₂ Feed Supplements, Vitamin D₃, Vitamin E Products, Vitamin E and BHT Products.

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U.S. INDUSTRIAL CHEMICALS CO.
Division of National Distillers and Chemical Corporation
99 Park Avenue, New York 16, N. Y.

New-product Ideas

From page 28

methods of analysis were basically the same. However, members agreed Ansul's analysis methods must be made more sensitive.

PIT members had a few ideas about production troubles. Again, research and pilot plant personnel put their heads together. A few weeks later they were able to report success.

With satisfactory delivery of the initial order, the same customer ordered more pyrrolidine, which again was produced successfully in the pilot plant.

At the final meeting of PIT 26, members agreed that the time had come to start producing pyrrolidine commercially.

Now a Standard Product

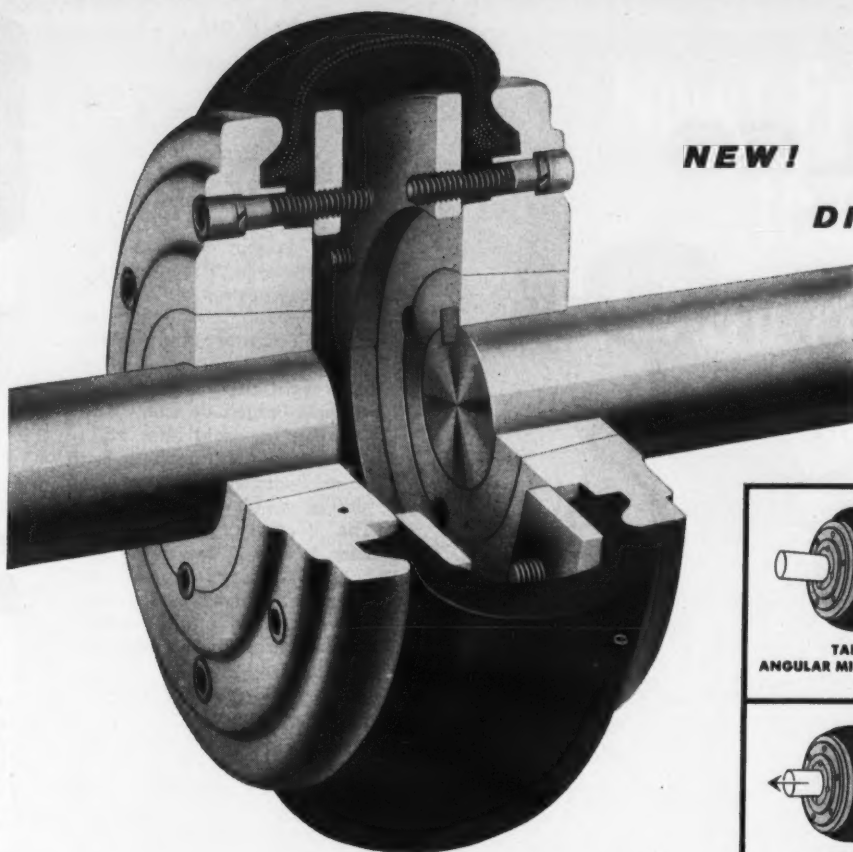
A termination report of the meetings of PIT 26 was written as a method of transferring pyrrolidine from the status of a development to a standard product.

The report stated: "At this point the quality of our product, the price of our product, the competitive situation, the potential volume and all other factors that go into marketing a product are fairly well defined. It is therefore logical that this product be transferred to our regular sales department."

The report concluded that pyrrolidine would probably remain a specialty chemical, but that Ansul could expect a substantial increase in sales volume, over the next several years. It was also recommended that the investigation of new uses for pyrrolidine be continued.

Ansul's product planning procedure has given management more confidence in all new-product predictions. The system, with its assurance of thorough and factual evaluation, has become an integral part of Ansul's management function.

For more information on product at left, specify 4189 . . . see information request blank opposite last page.



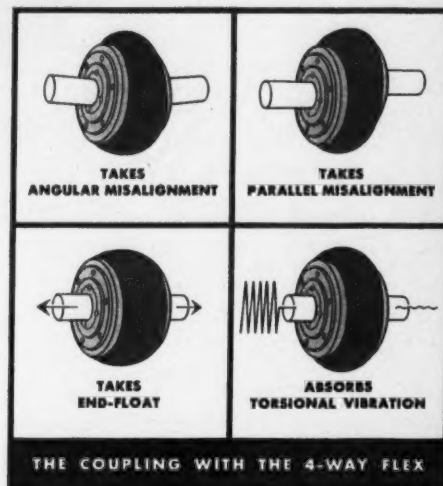
NEW!

DIFFERENT!

DODGE

Para-flex

FLEXIBLE CUSHION COUPLING



THIS coupling "swallows up" shaft misplacements. It automatically compensates for end-float, parallel misalignment, angular misalignment or any combination of all three. Moreover, it cushions the stresses of shock loads. And it absorbs torsional vibration—reducing noise and protecting machinery from vibration's destructive forces.

Here is a new type of performance—made possible by the development of a tire-like flexing element. Synthetic tension members, bonded together in rubber, give this element the stamina and dependability of modern, high-speed, high-load, shock-absorbing truck tires—and the ability to respond magically to all manner of changing shaft conditions.

Para-flex takes minimum space on the shaft. Mounting is simplified through the use of standard Taper-Lock bushings—no rebor-ing, no machining. Safety is promoted by flush design; there are no protruding

parts. No lubrication is required, no periodic inspection. And since the flexible member is molded with a transverse split, it can be replaced without moving either the driver or driven machine.

Para-flex Couplings are stocked by Dodge Distributors in popular transmission sizes. They are available from factory stock in capacities up to 825 hp at 1200 rpm. Call your distributor for early delivery to make your own test. You'll witness something revolutionary! DODGE MANUFACTURING CORPORATION, 6200 Union, Mishawaka Ind.

DODGE
of Mishawaka, Ind.



CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the white pages of your telephone directory for "Dodge Transmissioneer."

Check 4190 opposite last page

If

BUBBLES

cause trouble
in your
processing...



get DE-AIREX foam killer!

Bubbles or foam build-up can be troublesome and expensive in many chemical processes.

Economical, easy-to-handle liquid De-Airex can often stop this trouble, without interfering with production.

No single foam-killer stops *all* foam problems, but a simple, quick test in your plant can prove which De-Airex formula will work best for you.

De-Airex requires no pre-mixing or special equipment and dissolves immediately with ordinary agitation. It remains stable without stirring and is not affected by freezing.

For full details about De-Airex foam killer and Houghton's individualized "in-plant" service, call your Houghton Man today, or write E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

DE-AIREX FOAM KILLER

... a product of



Ready to give you on-the-job service

Check 4191 opposite last page

Right to Work

From page 29

Labor has been smarter than business in getting its story over, sometimes through use of catch phrases. For example, a right-to-work law has been called a "right-to-wreck" law by labor. No union has been wrecked by a right-to-work law. Fact is that the percentage increase in union membership has been greater in those states which have right-to-work laws than in those which do not.

Labor has said that right-to-work laws interfere with union security. This is completely without foundation. The security they interfere with is that of the union officials. Without compulsory unionism, a union leader must prove himself and is subject to the will of the membership.

Forced Rider

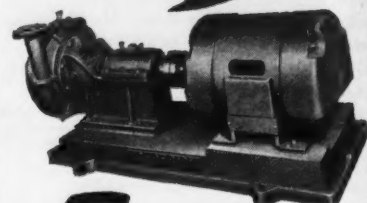
What about the free rider discussed so much by labor? Actually, the non-union member in a unionized plant is not a free rider; he is a forced rider. When the union demands the right to represent him, he loses his right to bargain individually with the company or collectively with another group of his choosing.

A union does not have to represent all of the employees



"Our competition got another big contract, now all we have to do is wait till they lose their shirts."

Custom-built for
**EFFICIENT
DEPENDABLE
SERVICE**



Frederick
SSV PUMPS

Enclosed Impeller and Open Impeller Types

You're sure of maximum service and output with minimum maintenance or production down time with Frederick SSV Centrifugal Pumps because each pump is custom-made to fit your particular operation—whatever the consistency or type of liquid you're moving.

SSV PUMP FEATURES

- Pump sizes from 1" to 4" discharge openings.
- Pump capacities from 50 up to 700 U.S. GPM.
- Heads from 30 up to 220 feet.
- Pump speeds can be varied to suit the driving media and operating conditions.

CONSTRUCTION ADVANTAGES

Pump casings are vertically split for easy accessibility. Mounted on a swivel to permit placing discharge in any desirable position. Pump openings, both suction and discharge, flanged to permit easier connection and disconnecting to joints. One-piece impellers, securely attached to shaft by stout key and lock nut, or threaded, give long service. Pump bearings mounted in sturdy frame horizontally split for easier accessibility. Extra long stuffing box provides for oversize stuffing. Mechanical seal also available for minimum leakage. Pump coupling flexible for direct connection to drivers or can be arranged for belt drive. Pump speed, pump openings, etc. are selected to suit your particular requirements.

Write for Bulletin No. 107



FREDERICK IRON AND STEEL, INC.
FREDERICK Est 1890 MARYLAND

Check 4192 opposite last page
CHEMICAL PROCESSING

in a plant to bargain collectively with strength. This has been affirmed by Mr. Harrison, a railroad labor leader.

In the last election, labor tried to show that clergymen of various churches who spoke out against right-to-work laws were speaking on behalf of their faiths. This is not true. They spoke as individuals. Clergymen have expressed opinions on both sides. Father Keller of Notre Dame has said that the right not to join is a corollary of the right to join.

Power of Labor Unions

The tremendous power of labor unions today is not fully realized. Income from dues now totals \$700 million per year. Welfare funds are up to \$32 billion, compared to \$20 billion in the federal social security fund, which has been accumulated over twice as long a period. Furthermore, welfare funds are increasing at a rate of \$3 billion per year. Secondary boycotts and mass union picketing can force a company out of business.

Business men and companies should take a stand on issues such as right-to-work. They should also encourage their employees to take an active part in politics and understand issues such as this.

Beer Filtration

From page 31

formerly used, contributing to the high quality of the beer.

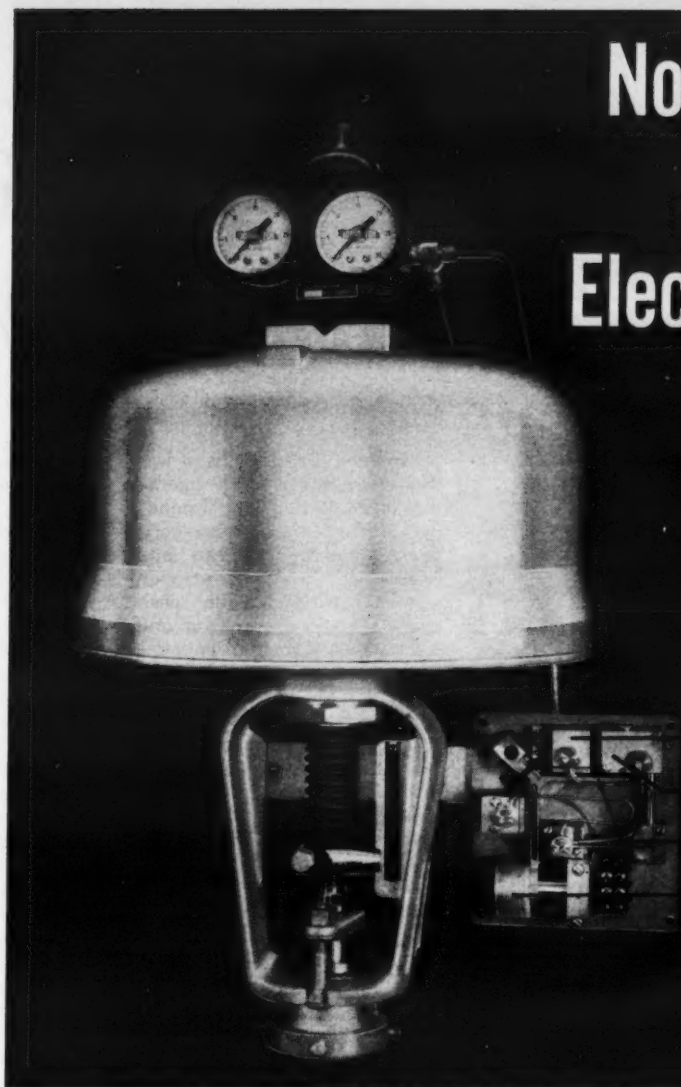
Another factor that helps brewery maintain high quality is the stainless steel construction of filter, which eliminates possibility of any metal contamination. Maintenance on unit has been practically nil during the period it has been in operation.

(Auto-Jet filter is product of United States Filter Co., 1910 N. Potrero Ave., El Monte, California.)

Check 4193 opposite last page.

MARCH 1959

Now! From Annin ...the Finest in Electro-Pneumatic Actuators



**Annin's Model 30,000
transducer, coupled with the Annin
Domotor, gives you greater
range of adjustment, unequalled
stability, and exceptional
dynamic characteristics**

The Model 30,000 has been developed to provide process engineers with a practical transducing element for converting a small electrical signal to an accurate and stable pneumatic output pressure. It embodies only four basic sub-assemblies, which minimize motion and wear, simplify adjustment and installation. The Model 30,000 features full-scale zero adjustment and a wide range of span settings for split range and sequencing applications. Absence of complex components, together with minimum installation, contribute to low maintenance. Linearity and accuracy reach a new high in electro-pneumatic transducing with the Model 30,000.

Technical data on request



Send for your copy
of Annin's new Catalog 1500-D

Annin VALVES

THE ANNIN COMPANY Division of The Annin Corporation
1040 S. Vail Ave., Montebello, California

Check 4194 opposite last page



Loading time cut 60%, labor 50%

Dockboards automatically adjust to truck heights; were installed overnight



Dockboard (A) adjusts automatically as truck bed level moves up or down during loading operation. When truck pulls away, dockboard rises to top position. Tilting bumper (B) is depressed by backing truck, activating cam hold-down system which automatically locks unit in loading position when board is stepped down



Problem: Loading beer was time-consuming, costly operation at Blatz Brewing Company, Milwaukee, because conveyors had to be run into trucks and two or three men were required inside each truck to unload conveyor and stack cases. Efforts to palletize became a problem because truck heights varied as much as 14 inches above dock level when vehicles backed in, and truck beds constantly became lower as cargo weight increased.

An alternative was to lay short, narrow plates from truck to dock so fork trucks could be operated. But this was impractical. Plates' limited dimensions and constantly shifting height of truck beds would prevent fork trucks from operating at high speeds with fragile, unstable loads. Furthermore, instability of dock plates constituted a safety hazard.

To break up existing dock and build conventional dockboard pits would have resulted in additional costs and loss of valuable shipping time in middle of spring rush.

Solution: Automatic dockboards employing torsion counterbalance system were installed without pit construction or dock alteration. Night crews performed work, and dockboards were in operation next morning without expensive concrete work or loss of time. Cost per truck position was about \$550 plus installation costs.

Dockboards automatically

lock when lowered to truck bed as vehicle contacts bumper-type operating arm on front of dock. When loading is completed and truck leaves, dockboards automatically rise off of carrier's bed.

With departure of truck from dock, torsion spring provides energy necessary to offset weight of dockboard and lifts it to its full above-dock position, ready to adjust to the next truck.

Results: Loading time was slashed more than 60 percent. High-cost dock labor was reduced, cutting loading costs more than 50 percent. Damage to cases and safety hazards were held to minimum by dockboards' permanent, non-slip mounting.

Palletization program has been modernized in that pallet loads are picked off of conveyor-fed palletizer by fork truck which moves them either directly into trucks or to storage.

Boards 8' long by 6' wide permit smooth, easy, and fast movement of fork trucks even with fragile, seven-case-high pallet loads.

Although some trucks backing into dock are 14 inches above dock level, length of dockboards keeps operating grades down for efficient operation.

(Series 1200 HI-LO Dockboards are manufactured and installed by Kelley Company, Inc., 2129 West Mill Rd., Milwaukee 9, Wis.)

Check 4195 opposite last page.

Automatic dockboards enable fork lift truck to load carrier quickly and efficiently, resulting in substantial savings in loading costs

HANDLING & PACKAGING

Silconic battery plate gives industrial units 10 to 25% longer life

Process using arsenic halts
grid separations

Uses: For greater battery performance at lower cost in motive power batteries.

Features: Silconic plate is said to give industrial storage batteries 10 to 25% longer life and improve electrical characteristics.

Descriptions: Unit was made possible by development of patented process for introducing arsenic and silver-cobalt sulfates into the active materials of positive plates of the battery.

Chemicals migrate to all positive grid members and collect on them to form insoluble oxide surface or protective sheath impervious to acid and oxygen. This prevents grid separations.

Solid-state migration of silver-cobalt causes it to penetrate deeply into grid metal during battery operation, thus prolonging life of plate.

Addition of arsenic to antimonial plate alloy eliminates porosity and insures heterogeneous grid free of flaws. Thus a smooth-flowing metal is produced during casting operation, which results in dense and uniform grid structure.

Where batteries are idle for periods of time, plate prevents migration of materials to negative plate, thereby reducing self-discharge within cell.

(Silconic plate is development of Industrial Div., Gould-National Batteries, Inc., Stone and Calhoun Sts., Trenton 7, New Jersey.)

Check 4196 opposite last page.

Flexible package designed to replace cans and jars is described in literature. Manufacturer says package, called "Canvelope," can be heat-sealed at top or folded twice and taped securely, and it can be exposed to high humidity, temperature cycling, rough handling. For literature and samples write to Kehr Products Company, 401 North Broad St., Philadelphia 8, Pennsylvania.

Check 4197 opposite last page.



If your product needs a special type lining for its steel pail or drum, do as other manufacturers have done: **COME TO VULCAN FIRST!** There are many reasons why manufacturers of hard-to-hold products turn to Vulcan for a solution to their lining problems. These reasons concern Vulcan's years of experience and research in the development of linings for a wide variety of products including chemicals, foods, drugs, oils, insecticides, paints, and varnishes, etc.

Contact Vulcan **NOW** regarding your lining problems! Vulcan chemists either have the proper protective interior lining for your product, or if none is presently available, will do their utmost to develop a new one. Samples gladly supplied upon request. Call or write Vulcan today.

Write Dept. CP 39.



Over 42 years Container Experience

VULCAN
CONTAINERS INC.

Bellwood, Illinois (Chicago Suburb)
Phone Linden 4-5000 from
other Cities

From Chicago Phone:
MAAnsfield 6-7660.

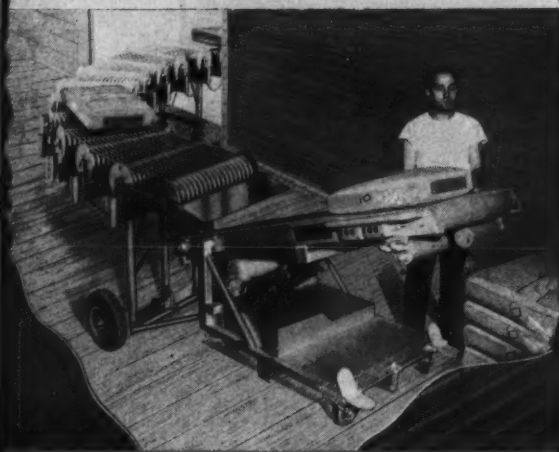
In Canada: Toronto 15, Ontario;
New Westminster, (Vancouver), B.C.

Representatives in all principal cities.
See "Pails" or "Drums"
in the Yellow Pages.

Check 4198 opposite last page

One-Man Loading for Box Cars and Trucks Is Now Possible in All Chemical Plants

New Power-Curve Swivel Stacker & Loader Shoots Bags into Place, Replaces Slow Hand Truck



The Power-Curve Swivel Stacker and Loader at a large chemical plant uses but one operator who merely guides bags a little with one hand as they stream into the car direct from the Packer. The single operator replaces a crew of three.

(Special)—The latest in bag loading techniques is now being demonstrated to chemical plant operators who are fed up with the slow, old-fashioned hand wheel truck. A single conveyor-stacker system conveys the bags all the way from the packing machine and speeds up the loading, delivers cleaner, neater bags, reduces in-transit losses, and recovers spillage and loose material within the plant. The Power-Curve system is able to amortize its entire cost in less than a year.

In U.S. and Canadian chemical plants today there are in daily use 184 Power-Curve units, including 46 Packer and transfer conveyors, 61 bag flatteners and elevators, and 77 box car and truck loaders. Virtually every type of dry chemical product is represented in the list of Power-Curve owners, with new additions every month.

Backing up the news of the money saving new system is a network of Power-Curve representatives in all areas equipped with sound movies in color showing actual chemical operations and the effortless loading of the new swivel stacker.

For complete details write

the Chemical Sales Division

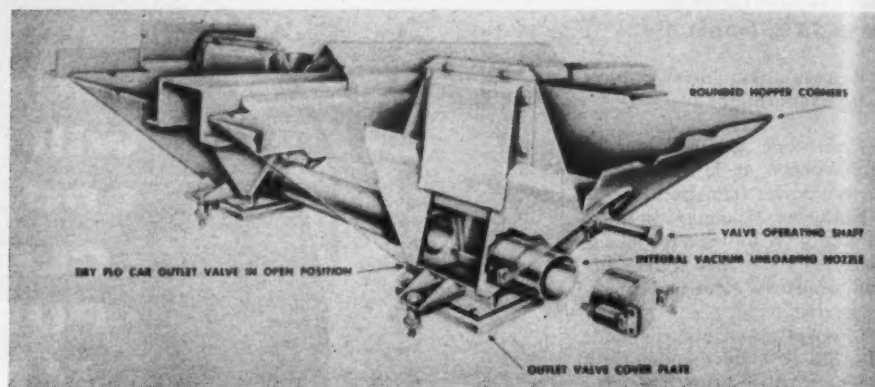
POWER-CURVE

CONVEYOR COMPANY

2185 SOUTH JASON ST., DENVER 23, COLORADO

Check 4199 opposite last page

MATERIAL HANDLING and PACKAGING



Internal unloading gates, roof welded to sides and ends insure . . .

Contamination-proof Rail Hopper Car

A contamination-proof, air-tight covered rail hopper car was unveiled recently. It is designed to handle in bulk certain chemicals, plastic granules, detergents, foods, and malt and feed ingredients which have had to be shipped in individual bags or containers.

The car contains these unusual features:

1. Internal unloading gates that have secondary seal provided by rubber-gasketed steel cover plate, thus preventing material loss during transit.

2. Roof continuously welded to sides and ends.

3. Loading hatches atop car which are made of cast aluminum with rubber gaskets.

Called the "Dry-Flo" car, the carrier has discharge outlets which are a minimum of 12" above top of rails to permit contents to be handled by all types of unloading systems.

The car is available in two sizes. One has 3500 cf capacity, the other 2450 cf. Either can be equipped with 50- or 70-ton trucks. Both are available either as single- or multiple-compartment cars. When compartmented, the larger will

have three compartments, the smaller will have two.

Both are AAR Class LO Type. Load limits of the larger are 104,200 lb (50-ton) trucks and 142,800 lb (70-ton), while on the smaller they are 114,000 lb and 152,600 lb. Other data are contained in table.

Outstanding feature is the internal unloading gates, housed entirely within the car, which assure complete sanitation. Gates eliminate pickup of foreign materials and solve other problems manufacturer says are usually associated with conventional exterior gates.

Gates open vertically. They are unaffected by pressure or flow of product being unloaded. This makes it easy to control flow rate of car's lading during un-

"Dry-Flo" Car Data

Car Capacity	2450 cf	3500 cf
Overall Length	42'6"	53'9"
Overall Width	10' 7-11/16"	10' 7-11/16"
Overall Height	14' 5-9/16"	14' 5-9/16"
Loading Hatches	6	10
Unloading Outlets	4	6

Cutaway diagram showing "Dry-Flo" car hopper assembly with interior outlet valve open but gasketed cover plate still in place

loading at plant site.

Pneumatic nozzles designed for vacuum unloading systems are optional equipment. They are placed so that unloading can be accomplished from either side of car.

With discharge outlets at least 12" above rails, car can be emptied by either vacuum or pressure pneumatic handling systems, by gravity feed into hoppers below track, or by any mechanical conveying system.

Roof construction embodies exterior car lines, providing smooth, unbroken interior ceiling surface. There are no projections to cause hang-up points encountered with conventional interior car line construction.

Hopper corners are rounded to a 2½" radius. They have no angular joints or welds, thus assuring minimum product retention and ease of cleaning.

If a shipper desires, special linings may be applied to interior.

("Dry-Flo" hopper car is development of General American Transportation Corporation, 135 South La Salle St., Chicago 90, Ill.)

Check 4200 opposite last page.

Automated batching by pre-punched formula cards is described in two-page bulletin. Also discussed are related benefits: formulation privacy, continuous operation from any card, simplified record-keeping. Bul NP-2—Richardson Scale Co., Van Houten Ave., Clifton, N.J.

Check 4201 opposite last page.

Pallet truck models and benefits are shown in illustrated 24-page book. Specifications are provided. "Pallet Handling in Narrow Aisles"—The Raymond Corp., 58-170 Madison St., Greene, N.Y.

Check 4202 opposite last page.

Permaglas Storage Structures eliminate packaging costs

Texas Corporation maintains contamination-free operation in changing from costly packaging to economical bulk handling.

Towering above the flat Texas Plain at Big Spring—four Permaglas Storage Structures testify to the wisdom of the change from packaged to bulk materials-handling and storage.

ding and storage.

Specified by Blaw-Knox engineers, materials-handling consultants for a wide variety of industries such as foodstuffs,

chemicals, feed ingredients, rubber, plastics and pharmaceuticals—the Permaglas Structures met all requirements. These steel structures—glass-protected inside and out—safeguard products from contamination and discoloration... and are ideal for storing bulk materials—granular, flaky, pulverized, hygroscopic, contaminable, edible or non-edible.

Delivered and erected quickly at low cost, the Permaglas Structures require little maintenance—no need for painting.

Permaglas system planning service helps you evaluate your materials-handling methods. The Permaglas man in your area will work with you and your staff to give you a complete and factual description, cost summary and recommendation on your present or future materials-handling system. The Permaglas Service includes data on A. O. Smith's exclusive mechanical sweep-arm bottom unloader for complete mechanization of your bulk handling and storage operation.

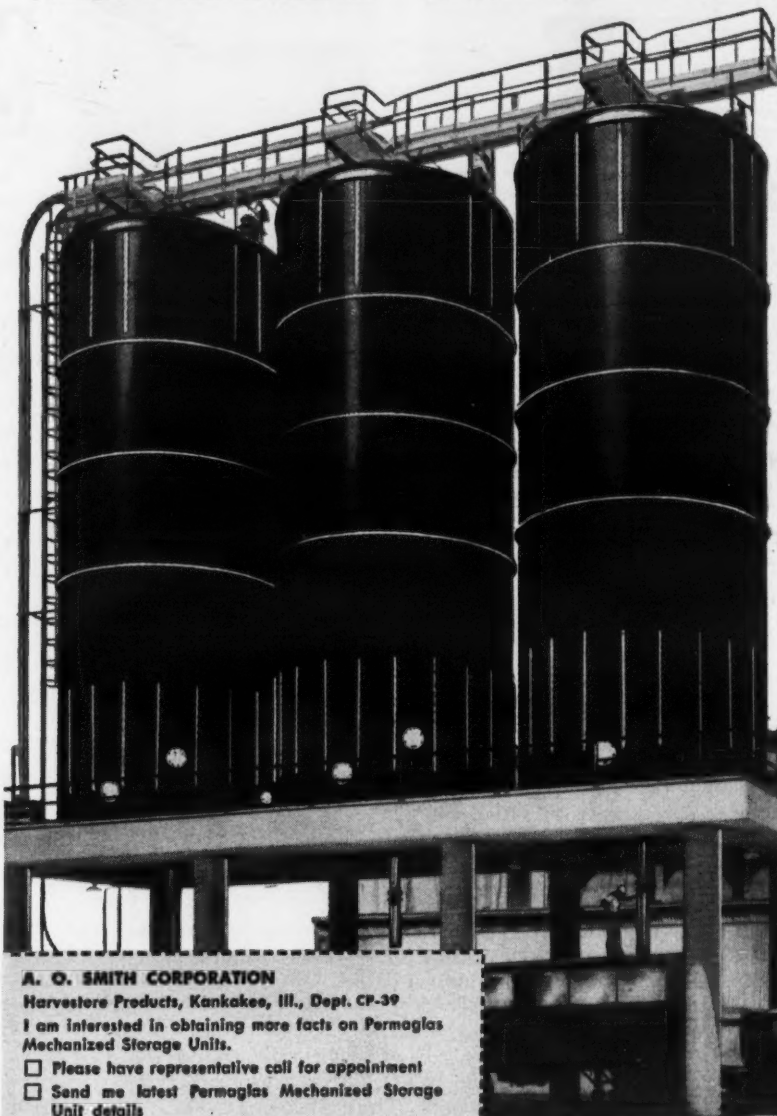
* HYDRASTEEL PROCESS covered by U. S. Patent No. 2,794,222

Through research... a better way

A.O. Smith

HARVESTORE PRODUCTS
Kankakee, Illinois

A. O. Smith INTERNATIONAL S. A., Milwaukee 1, Wis., U.S.A.



A. O. SMITH CORPORATION

Harvestore Products, Kankakee, Ill., Dept. CP-39

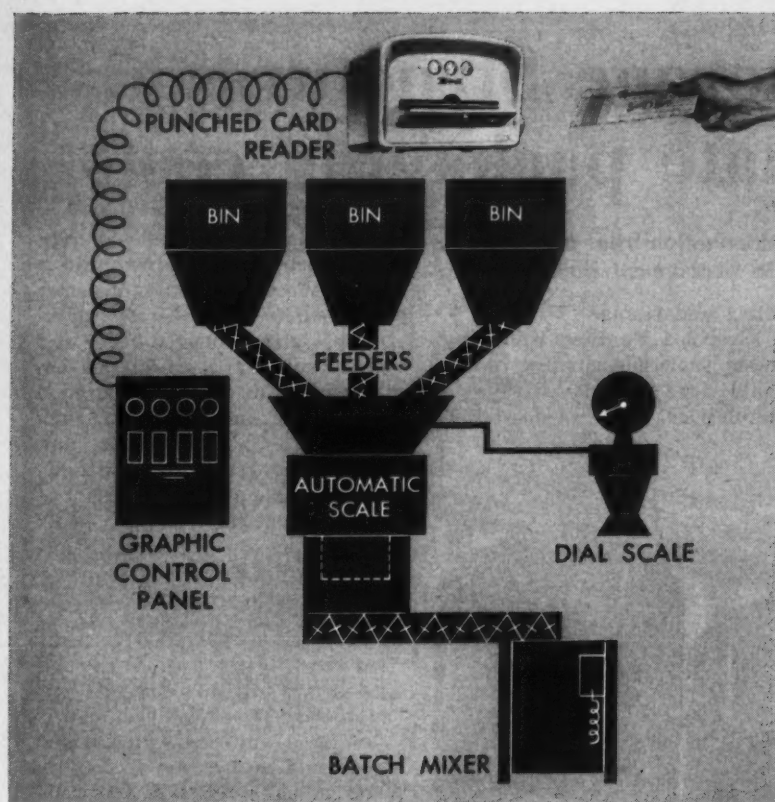
I am interested in obtaining more facts on Permaglas Mechanized Storage Units.

- ☐ Please have representative call for appointment
☐ Send me latest Permaglas Mechanized Storage Unit details

Name
Firm
Address
City Zone State

Cosden Petroleum Corporation's three 20' x 50' Permaglas Bulk Storage Structures are loaded by pneumatic conveyor. They discharge ½" cube polystyrene molding pellets by gravity into bulk transfer trucks below. A fourth 14' x 15' Permaglas Structure safely stores crumb rubber.

Check 4203 opposite last page



RICHARDSON SELECT-O-WEIGH AUTOMATES FROM BIN TO BATCH

The Richardson Select-O-Weigh system governs all components required for automatic formulation by weight of any product, liquid or solid, involving any number of ingredients.

Programming — by a Punched Card Reader or alternate control systems

Flow Control and Indication — at one remote control panel, housing complete process circuitry

Feeding — feeders engineered for specific materials and needs

Weighing — by Richardson Automatic Scale, accurate to 1/10 of 1%

Mixing — of ingredients in completed batch

Readout — counters, totalizers, printers, typewriters, recorders of all types

When required, service is available from Richardson's nationwide network of service facilities . . . within 24 hours. Custom-engineered by the world's foremost manufacturer of automatic weighing and proportioning equipment, Select-O-Weigh helps you make a better, more uniform product, at lower cost. For full details write, wire or call today.

Richardson Scales conform to U.S. Weights and Measures H-44 for your protection.

Richardson
MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY • CLIFTON, NEW JERSEY
Sales and Service Branches in Principal Cities
Also Manufactured in Europe to U.S. Standards

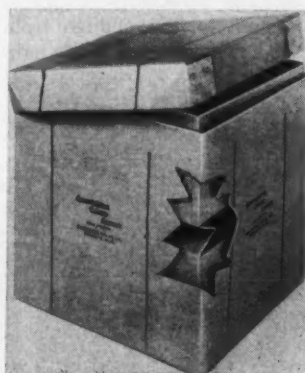
Check 4204 opposite last page

HANDLING & PACKAGING

Corrugated container with bellows corners cuts bowing problem

Uses: For shipping granular and powder bulk materials.

Features: Corrugated shipping container has inner corrugated tube with bellows corners at major stress points.



Bellows corners virtually make it impossible for corrugated container to bow

This nearly eliminates bowing. Bellows corners reduce outward strain and increase stacking strength of fully-laden containers. Storage is facilitated by unit's construction, which makes it possible for entire package, including tube, to be flattened.

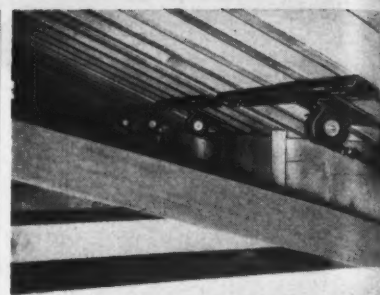
Description: Corners of unit lock when bellows scores are broken, creating two separate container compartments.

When being filled, inner tube is fitted into a tray which becomes package's primary bottom closure. After packing, tube is covered by an outer case which is capped by another tray and closed at bottom by series of four flaps.

(Cargo Carrier is development of Fibre Drum & Corrugated Box Div., Continental Can Company, 530 Fifth Ave., New York 36, N.Y.)

Check 4205 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.



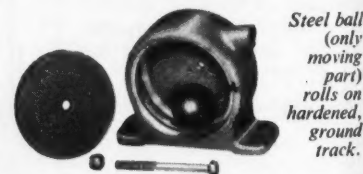
AiroViber installation is simple, low-cost.

Keep bulk materials MOVING!

Gain Quiet, Efficient Materials Movement and Low-Cost, Maintenance-Free Operation with AiroViber Vibrators!

Wherever you load, unload, move, package, process, grade or separate bulk materials, you can keep them MOVING with simple, ball type, pneumatically-operated AiroViber Vibrators!

- Start without fail.
- Trouble-free — only one moving part.
- Completely unaffected by surrounding conditions or temperatures.
- No lubrication needed.
- No periodic maintenance required.
- Speed is controlled by air valve.
- Amplitude can be altered.
- Where explosive conditions exist bronze balls may be used.



WRITE TODAY for full information!

VIBER COMPANY 726 S. Flower St.
Burbank 46,
California



Pioneers and leaders in the manufacture of

VIBRATORS

Check 4206 opposite last page

CHEMICAL PROCESSING

THAT'S
INTERESTING

**Faster ship
unloading**

A faster method of unloading large quantities of military supplies from ships is being sought by the Armed Forces. Also needed is a spark-enclosed electric fork truck for handling ammunition.

**Inventory
by air**

Aerial coal inventories, replacing ground-level surveyed inventories are saving time and money at four Public Service Co. of Colorado steam generating plants. Inventory man-hours have been cut from 1000 to 68. Photogrammetric survey takes less than one hour's flying time plus 20 hours by one man to compute volume from three-dimensional contour maps.

(Industrial Research Newsletter, Armour Research Foundation of Illinois Institute of Technology)

For more information on product at right, specify 4207 see information request blank opposite last page.



10 hours' work in an 8-hour shift!

That's the production advantage of the Yale Industrial Tractor Shovel

Here are the features that make the Yale Industrial Tractor Shovel outstanding...

PRECISELY CONTROLLED HORSEPOWER! 72 hp. 6 cylinder engine provides smooth power through matched torque converter and Yale torque transmission (fully automatic). One speed in both directions. Inching control permits delicate close-quarter maneuvering. Extra punch for impact loading. Accelerates to 13 mph. in 5½ seconds.

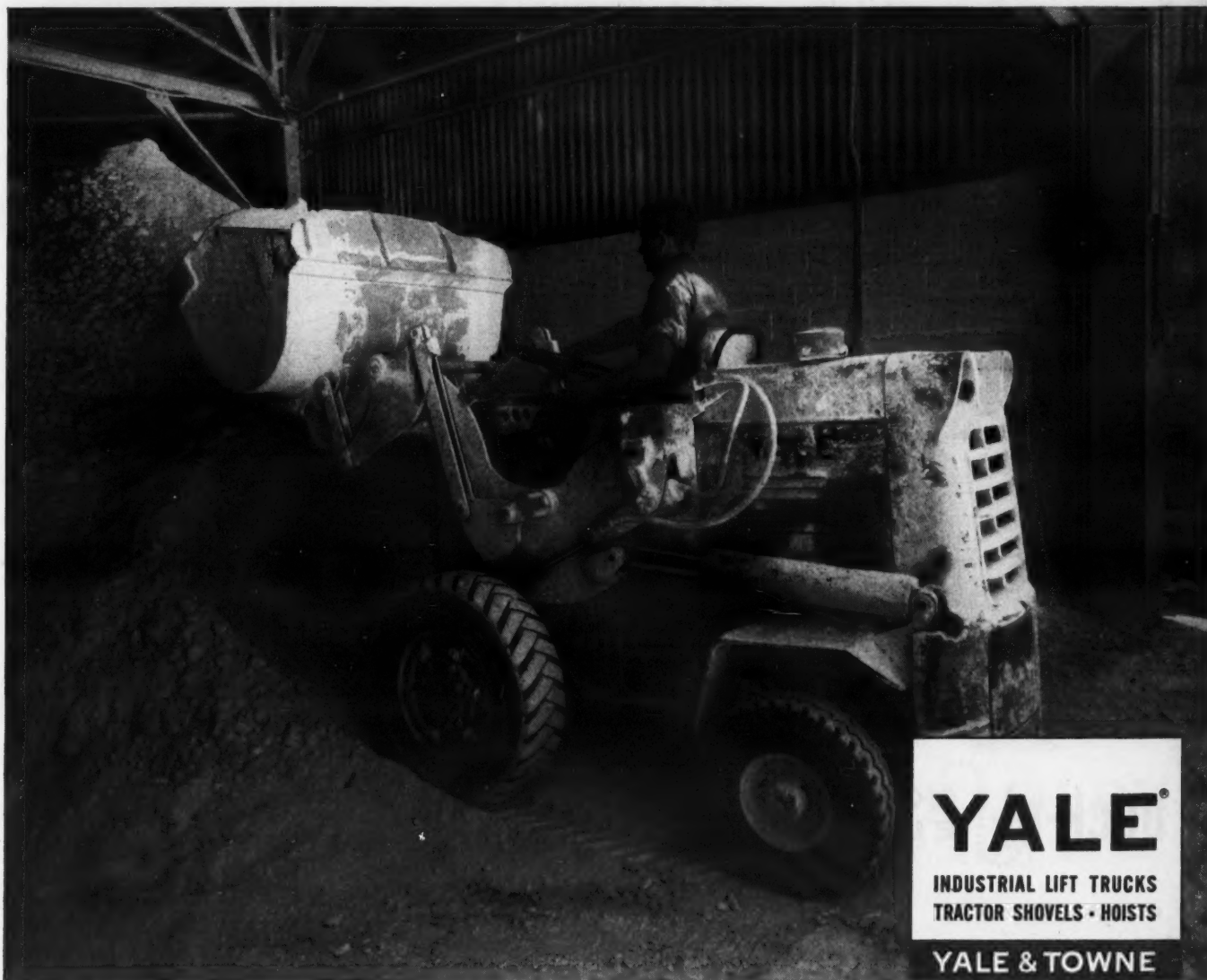
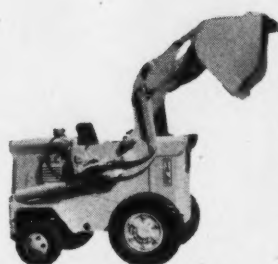
PERFORMANCE! 2500 lb. carry capacity. Exclusive 45° bucket tipback permits faster loading and lowest carry position for faster transport with minimum spillage. 6' dumping clearance permits dumping into bins and hoppers out of range of other—even larger—tractor

shovels. Shortest turning radius, too—only 73".

SAFETY! Safety-curve lifting mechanism members never rise alongside the operator. Front and back working lights provide extra security.

DEPENDABILITY! Rugged design • sealed brakes and electrical system • protected steering linkage • 10 ply tires—all adds up to more work at less cost...more production hours. Full range of buckets and attachments available.

Field applications prove that these features add up to 25% more work per hour—10 hours' work in an 8-hour shift. For a demonstration in your plant or complete information contact your Yale representative. Or write The Yale & Towne Manufacturing Company, Yale Materials Handling Division, Dept. YT 2-V.



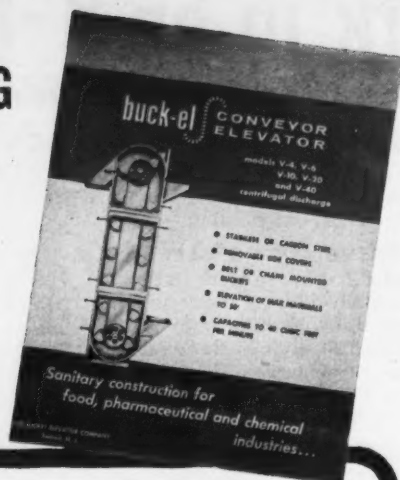
YALE®

INDUSTRIAL LIFT TRUCKS
TRACTOR SHOVELS • HOISTS

YALE & TOWNE

Yale Materials Handling Division, a division of The Yale & Towne Manufacturing Company. **Manufacturing Plants:** Philadelphia, Pa., San Leandro, Calif., Forrest City, Ark. **Products:** Gasoline, Electric, Diesel and LP-Gas Industrial Lift Trucks • Worksavers • Warehouse • Hand Trucks • Industrial Tractor Shovels • Hand, Air and Electric Hoists

Write today for NEW FREE CATALOG on BULK MATERIAL SANITARY CONVEYOR ELEVATORS

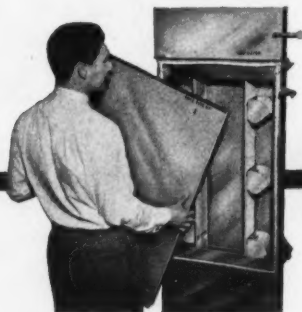
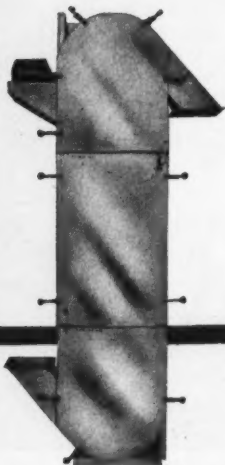


SEE HOW EXCLUSIVE CANTILEVER DESIGN permits complete removal of casing covers, pulleys and belting without disturbing bearings, mechanical seals or other operating machinery.

Can be completely disassembled in five minutes . . .

- for easy maintenance and cleaning
- for changing buckets to meet new operational requirements

Used by chemical, food, and pharmaceutical industries for elevating bulk materials



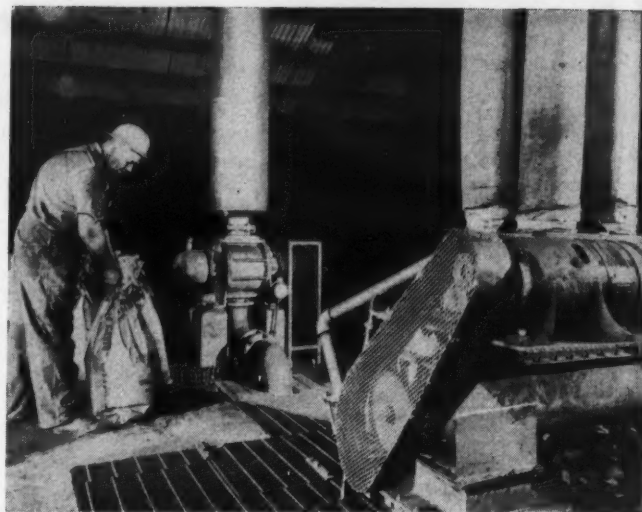
buck-el CONVEYOR
ELEVATOR

product of
THE BUCKET ELEVATOR COMPANY
360 So. Springfield Avenue
Summit, New Jersey

Phone: CRestview 3-5359

Check 4208 opposite last page

MATERIAL HANDLING and PACKAGING



Pulverized charcoal is moved from hammer mill (right) by screw conveyor to pneumatic conveyor in background

Switch to new conveyor system slashes upkeep costs 95%

Pneumatic setup saves \$100 a month;
provides safe, convenient, dustless
way of handling pulverized charcoal

Problem: Frequent mechanical failures with resultant downtime were a continuous headache with complicated open handling equipment used to move pulverized charcoal at old plant of Tennessee Products & Chemical Corporation.

Equipment, subjected to heavy dust, failed as often as three times a week, with each breakdown averaging two hours. Cost of labor and materials lost per hour of downtime was \$5. Maintenance costs were high because equipment frequently clogged.

Dust-laden atmosphere was hard on men as well as machinery. Incalculable amounts of usable material were lost. The open handling system was a constant threat to safety of workmen.

Solution: The company selected a pressure-type pneumatic conveyor with integrated dust collecting system for its new plant which began operations in June 1957, at Wrigley, Tennessee.

Charcoal which is pulverized in hammer mill is blown through enclosed pipeline to 30-ton storage bin 150 feet distant. Material is completely confined within processing equipment and conveying system. By having conveying lines conform to plant layout, the most efficient use of space is obtained.

A dust control system, integrated with the pneumatic conveyor, collects dust from 11 strategic locations throughout plant. Dust is also drawn to the storage bin. Here a filter,

mounted integrally above the bin, recovers finer dust from all operations at rate of two tons per day, eliminating waste and keeping plant air clean.

Results: Reduction of 95 percent in conveyor maintenance costs over old plant system reported. This has resulted in \$100 monthly saving in labor and material costs. Dependable flow of pulverized charcoal available when and where it's needed.

Because system has no exposed moving parts, threats to workmen's safety have been eliminated. Maintenance is negligible because only a minimum number of moving parts are contained within system.

Dust cannot pollute plant atmosphere as conveyor pipelines are completely enclosed. Clogging has been eliminated by self-cleaning features of the system.

(Airstream Conveyor, dust control system, and Multi-Bag Filter are manufactured by Dracco Div. of Fuller Co., 4063 E. 116th St., Cleveland 5, O.) Check 4209 opposite last page.

Under-surface method fills cans 300% faster than from the top

Filling half-gallon and gallon "T" style cans with an extremely foamy product is 300% faster by using an under-surface method than by filling from the top, reports a leading manufacturer of floor and automotive waxes and polishes.

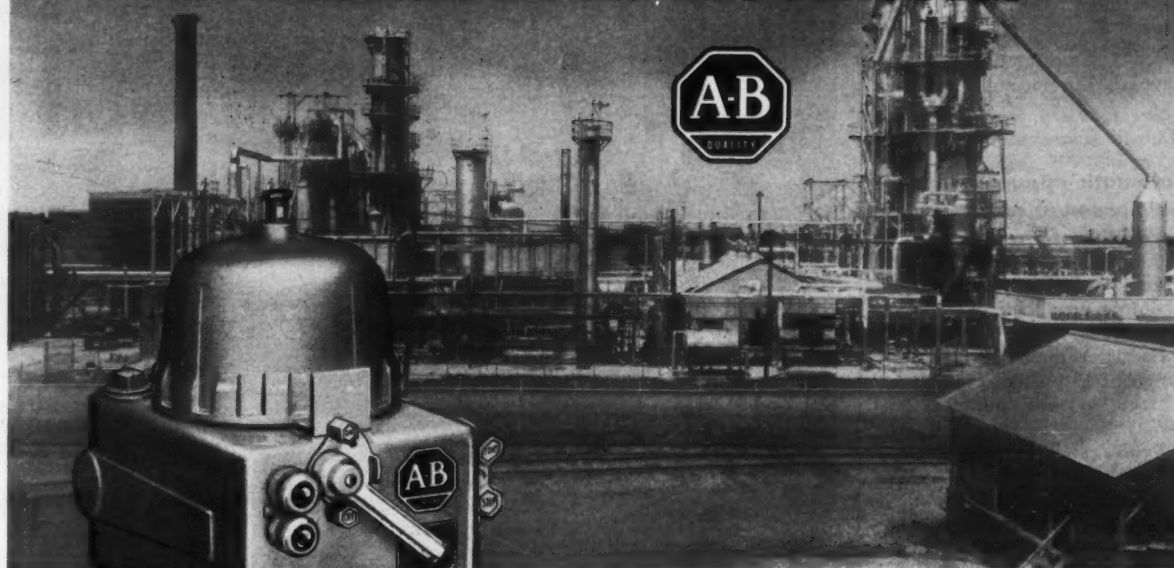
Use of a double-action valve on the filling equipment permits filling tube to be withdrawn gradually from the container at such a rate that entering liquid always is just below the liquid surface.

Patented under-surface filling mechanism is built into a conventional gravity filler so that filler may be used readily as a standard gravity filler.

(Model HB-BS-9 filling machine is development of Horix Manufacturing Co., Corliss Station, Pittsburgh 4, Pa.)

Check 4210 opposite last page.

Combines Maximum Safety with Minimum Maintenance in Hazardous Locations



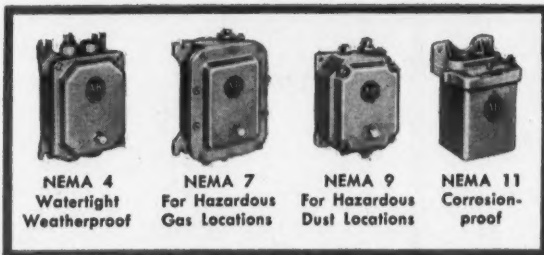
Bulletin 713 combination starter in Crouse-Hinds screw type enclosure for hazardous gas and hazardous dust locations. Screw type covers permit quick access to starter or disconnect switch.

When safety regulations require special enclosures for your motor control, inspection and maintenance costs can become an important consideration. With Allen-Bradley starters you can practically eliminate these expenses because these starters operate over long periods of time—without attention.

The reason is simple. Allen-Bradley solenoid starters have only *one* moving part. There's virtually nothing to go wrong. This is your assurance of millions of trouble free operations. And, the double break, silver alloy contacts never require servicing — they remain in perfect operating condition until completely worn away. Inspection only once or twice a year is ample. And, with the spin-type NEMA 7 and 9 enclosures, inspection is greatly simplified. Combine maximum safety with minimum maintenance — specify Allen-Bradley *quality* motor control in all your hazardous locations.

Allen-Bradley Co.

104 W. Greenfield Ave., Milwaukee 4, Wisconsin
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.



ALLEN-BRADLEY
MOTOR CONTROL
QUALITY

Check 4211 opposite last page

HANDLING & PACKAGING

Double side handle . . .

. . . which easily supports weights of 50 lb and more makes loaded multiwall bags as convenient to carry as a suitcase. Designed for easy, controlled pouring, bags, initial uses have been in fertilizer and feed fields. Side Handle bags are product of Multiwall Department, Hudson Pulp & Paper Corp., 477 Madison Ave., New York 22, New York.

Check 4212 opposite last page.

Automatic apparatus tests pressure of all aerosol containers

Equipment also vents gas to obtain product seal

Uses: Automatic apparatus for testing pressure in pressurized valved cans, bottles, etc.

Features: On valved containers with dip tubes, equipment vents gas to obtain a product seal without discharging any of product. It also automatically fills dip tube to any desired level, automatically tests pressure as containers move down assembly line, and automatically rejects all containers not pressurized within acceptable limits.

Equipment can be installed on any new or existing aerosol line. The only requirements are a 110v electrical outlet and an air supply. Tester and venter can automatically pressure-test and accept or reject up to 60 containers a minute.

Description: On aerosol containers with dip tubes where it is desirable to vent some of the gas to lift product up into dip tube to form a product seal, compressed air supply is regulated, by valve, usually 15 to 25 psi below lowest acceptable pressure in can. Air supply is connected directly to testing head, and is used to automatically preload it prior to actual testing of each can. Equipment may be installed in single or double rows on line. Containers coming down line position

Another "First" from General American



New companion to the Airslide® car, the Dry-Flo car permits you to bulk-ship many dry ingredients (especially foodstuffs and other materials that require special protection from contamination) that ordinarily must be shipped in individual containers.

General American's new Dry-Flo car is competitive in price with ordinary covered hopper cars and offers you these exclusive advantages:

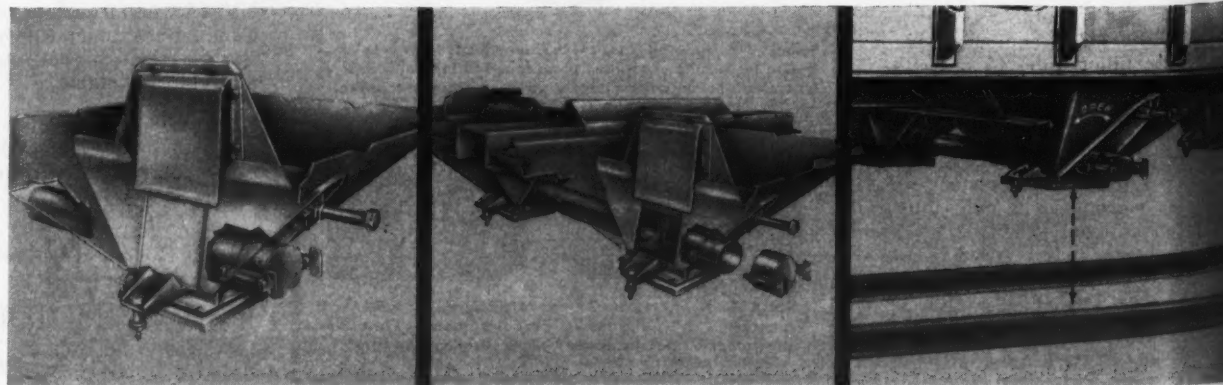
1. Unloading gates are *entirely within* the car . . . eliminating pick-up of foreign material.
2. Gate valves open and close *vertically*, and are not subject to pressure of the load. Rate of flow can be

adjusted as required.

3. The DRY-FLO® car unloads easily, either pneumatically or mechanically. Only two nozzles are required for the car with 2450 cubic feet capacity, three for the larger car that holds

3500 cubic feet.

4. Once car is loaded and hatches sealed, no outside air can enter. For this reason hygroscopic materials shipped in Dry-Flo cars cannot pick-up moisture from external sources.



HANDLING & PACKAGING

themselves automatically under testing head.

Where no gas discharge can be tolerated, tester is pre-loaded with some of the propellant instead of air, usually about 5 to 10 psi higher than the maximum acceptable pressure.

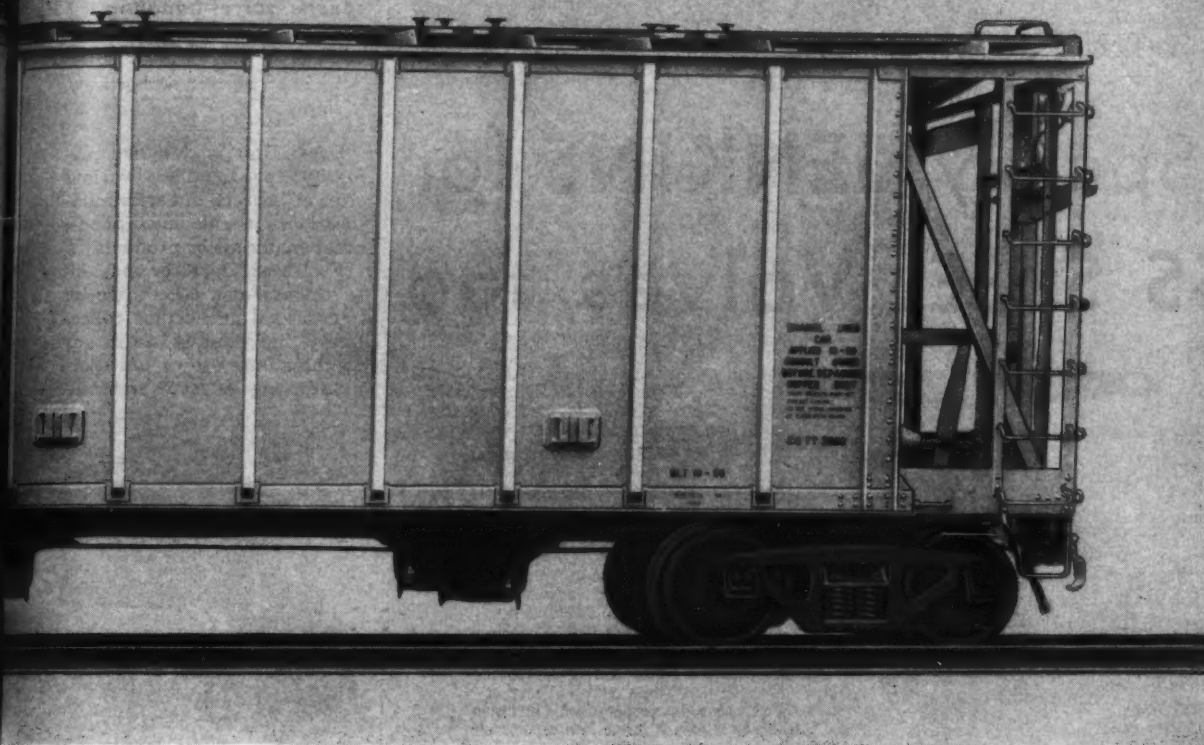
Electrical circuit of pressure-tester control is so designed that should any part of the system malfunction, the tester will immediately indicate this to the operating personnel, and it will not allow any containers to pass through it. This assures 100%-positive quality control.

Tester model CA-1 may be used on any kind of container utilizing any type of valve where only under-pressured containers are to be detected and automatically rejected.

Tester model CA-8 may be used on any kind of container where both under-pressured and over-pressured containers are to be detected and rejected. In addition, this tester should always be used on products where no gas discharge can be tolerated.

(Models CA-1 and CA-8 Robins Aerosol Pressure Tester and Venter were developed by The Robins Engineering Co., 208 Maple Avenue, North Haven, Conn.)

Check 4214 opposite last page.



5. The DRY-FLO car provides considerably more clearance for unloading . . . permits use of all types of unloading equipment at rail siding or team track.

6. Roof construction features exter-

ior car lines . . . provides a smooth, unbroken ceiling surface and eliminates hang-up points.

7. Hopper corners are rounded to a 2 1/4" radius with no angular joints

. . . allow complete removal of product, make cleaning easier.

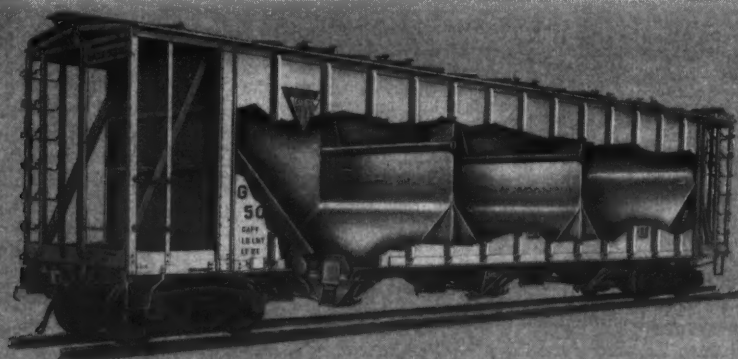
8. All-welded construction of the DRY-FLO* car makes interior coating easy when needed to protect cargo.

Consult your nearest GATC office for details about this revolutionary car.

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South LaSalle Street • Chicago 90, Illinois
In Canada: Canadian General Transit Co., Ltd., Montreal
Offices in principal cities

*Trade mark



Check 4213 opposite last page



"Barnes, this woman's collecting for the variety club."



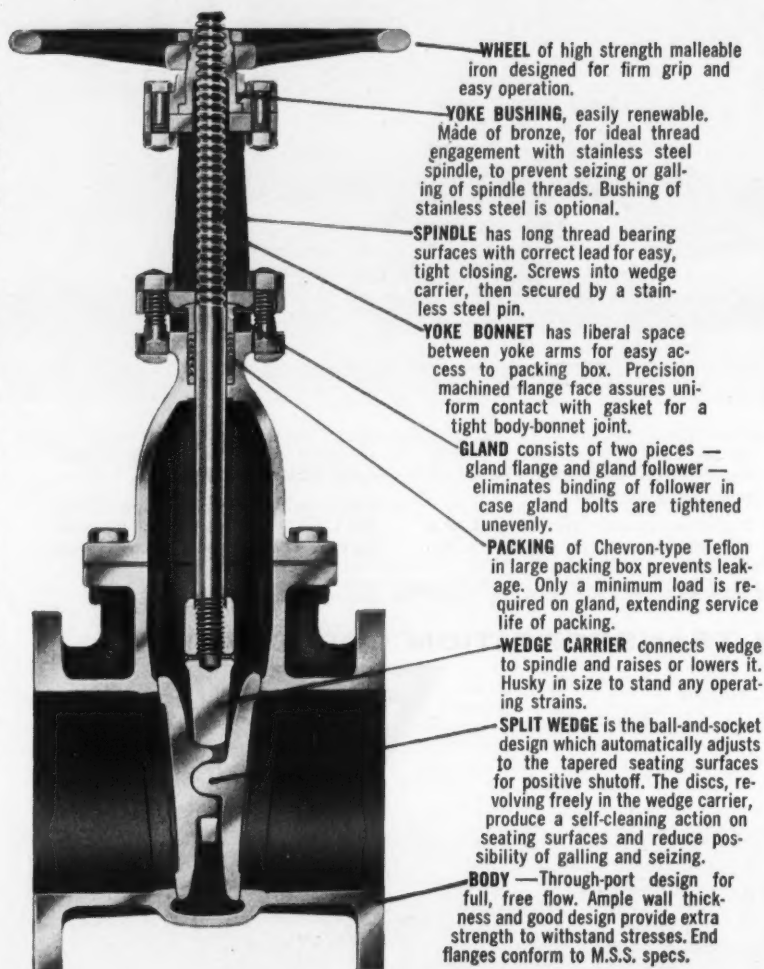
In this Split Wedge Gate
you can see why it pays to

Specify JENKINS for STAINLESS STEEL Valves, too

This picture shows the many points of excellence in the design and construction of Jenkins Fig. 1327 Split Wedge Stainless Steel Gate Valves. Compare them with any valve you know. You'll conclude that it's hard to beat Jenkins at making valves, no matter what the material.

But no picture can show the quality of the castings . . . the precision machining . . . the rigid inspection and testing that have gone into this valve. All of these are as important as design and metal alloys in assuring long, dependable, economical valve service. And, all of them are up to the peak standards for which Jenkins has been known for almost a century.

SEND FOR NEW CATALOG of Jenkins Stainless Steel Valves. You'll find in it the patterns you want, in a choice of alloys that satisfy the requirements of practically all corrosive services. Also, you'll see that these Jenkins valves meet valve industry specifications and the high standards established by the leading users of stainless steel valves. Jenkins Bros., 100 Park Avenue, New York 17.



HANDLING & PACKAGING

**Lifts four 55-gal drums,
speeds barrel handling,
promotes safety**

Lifts barrels collectively,
singly

Uses: Unit is designed primarily for handling various sizes of barrels, but with modifications it can also handle other materials or products.

Features: Operator may lift or release one, two, three, or four 55-gal steel drums, collectively, individually, or in any combination. Use of unit permits savings of labor and time.



Vacuum barrel handling unit, attached to fork lift truck, can lift four 55-gal steel drums, each weighing 490 lb, collectively or individually

It eliminates dangerous practice of having personnel roll barrels on edge.

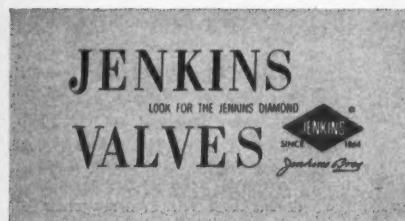
Description: Source of power for barrel-handling unit is an hydraulic motor-driven vacuum pump designed to operate in conjunction with regular hydraulic system of fork lift truck. Each unit is equipped with dashboard panel controls.

Light Says Lift

When vacuum pad grips barrel securely, green light on control panel indicates barrel is ready for lifting and moving. Barrels evacuate themselves to atmosphere rather than using normal "blow-off" system. This means elimination of excessive hose connections and pulley systems.

(Vacuum barrel handler is product of Vac-U-Lift Co., Salem, Illinois.)

Check 4216 opposite last page.



Sold Through Leading Distributors Everywhere

JENKINS BROS., 100 Park Avenue, New York 17, N. Y.



☐ Send the new stainless steel valve catalog

☐ Have a representative call on me

NAME & TITLE.....

COMPANY.....

ADDRESS.....

Check 4215 opposite last page

GAYLORD PACKAGING

GIVES PRODUCTS SAFE-CONDUCT

Nothing like a feeling of security when products get their travel orders, what? Gaylord corrugated boxes give safe-conduct. Strong, stout, sound, snug. Special materials, adhesives. Most ingenious chaps, Gaylord packaging engineers.

Should you require regular containers in vast quantities, or specialized packaging, your nearby G-Man is jolly well ready to discuss economical protection. You, too?



For more information on product at right, specify 4217 see information request blank opposite last page.



GAYLORD

CONTAINER CORPORATION



HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

DIVISION OF **Crown Zellerbach Corporation**



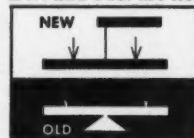
NEWS ABOUT SCALES



How do they build unvarying accuracy into this remarkable new kind of weighing instrument?

For 7,000 years men have employed the multi-part pivot balance to compare weights. As the parts of their pivot joints wore, the problem of retaining accuracy became more and more acute. Then in 1956 the United States issued a patent for a "Thayer Flexure Plate" Leverage System. A team of engineers and businessmen, aware of industry's great cumulative loss of materials in weighing operations, had devised a revolutionary new scale. Knife-edge pivots that progressively wear and change were replaced by Thayer Flexure Plates that move only .001", yet accurately reflect the minutest changes in weight. This firmly joined lever withstands

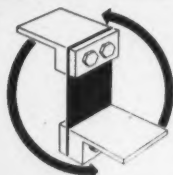
shocks and vibrations indefinitely. Dirt and dust are no longer a problem.



Thayer guarantees this leverage system accurate for the life of the scale.

How Can It Save You Money Year After Year?

Working in conjunction with straight electrical controls, it forms the most reliable, low maintenance system ever devised to control processing or materials handling *by weight*. Literature on its application to filling, batching and checkweighing operations is available on request.



THAYER SCALE

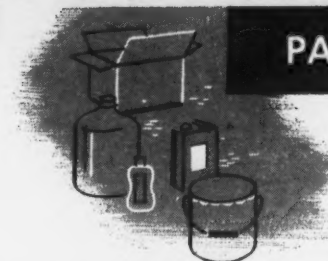
AUTOWEIGHTION SYSTEMS FOR FILLING,
BATCHING AND CHECKWEIGHING

THAYER SCALE CORP. • 6 THAYER PARK, PEMBROKE, MASS.

Check 4218 opposite last page

PACKAGE IDEAS

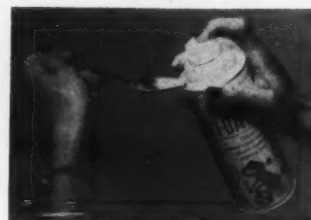
Latest developments
in packages
and their design



Stacking, palletizing . . .

. . . are easy with single-gusset sewn-valve multiwall bag designed to create more usable space and reduce blowouts. Product fed into bag does not back up and clog filler spout. This improved packer performance is said to reduce packaging time and labor requirements. According to manufacturer, extra space created by flat tube side often permits utilization of shorter bag and reduces cost of bagged products. Single-gusset multiwall bag is product of Bemis Bro. Bag Co., 408 Pine St., St. Louis 2, Missouri.

Check 4219 opposite last page.



New packaging concept . . .

. . . for a heavy liquid product is this pressurized dispenser for liquid multivitamin preparation. Previously, there had

been no suitable propellant or valve with enough efficiency to force heavy liquid from a pressurized container. Besides, the propellants cost too much and took up too much space.

This push-button container has a new-type valve that works well under high pressure. The propellant is nitrogen, an inert gas, which provides the required pressure with complete safety. At present, container is available only in 12-oz size. However, research is under way to determine feasibility of packaging other quantities under pressure.

(Aerosol can is made by American Can Company, 104 South Michigan Ave., Chicago 3, Illinois.)

Check 4220 opposite last page.

(Spout and valve are manufactured by Precision Valve Corporation, 700 Nepperhan Ave., Yonkers, N.Y.)

Check 4221 opposite last page.



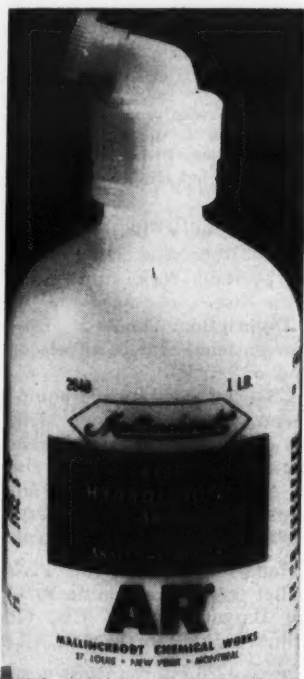
Corrugated drum . . .

. . . of octagonal design is used by rubber company for shipping certain types of airfoam cushioning in 100-ft strips. Drum's construction permits shipment and protection of loads of more than 200 lb.

CHEMICAL PROCESSING

Container has three pieces: a stitched tube and two double-flanged end sections. Ends are reinforced with an extra octagonal pad glued to inside center panel. End sections fit entirely within tubular body. They are so constructed that they "give" with lateral motion of airfoam rolls. This prevents end section stitches from pulling away from body of drum under compression or sudden shock.

(Flexible End Drum is produced by The Hinde & Dauch Paper Co., subs. of West Virginia Pulp and Paper Co., 4265 Decatur St., Sandusky, Ohio.) Check 4222 opposite last page.



High-density polyethylene

... is used for hydrofluoric acid container which features a special closure that delivers acid drop by drop or in a steady stream. Any acid remaining on spout is sucked back into unbreakable bottle. Label is printed directly on container.

(Polyethylene container is produced by Plax Corp., PO Box 1019, Hartford, Conn.)

Check 4223 opposite last page.

A COST SAVING CONTAINER!



CUBITAINER® FOR CORROSIVE CHEMICALS

Virginia Smelting Co., says:
"Safe and easy to handle."

CUBITAINER, a molded polyethylene insert with "easy-flow" spout in a sturdy corrugated carton ... for liquids and powders ... regular or corrosive.

- **Economical.** Low and competitive original cost, plus savings in storage and shipment.
- **Durable.** Non-breakable ... meets industry and Government standards for safe handling and shipment.
- **Light.** Tare-weight $\frac{1}{4}$ of glass; $\frac{1}{4}$ of metal.
- **Saves storage space.** When empty, takes just a fraction of the space used by other containers. When filled, CUBITAINERS stack compactly. Take 25% less space.
- **Expendable.** No return-trip costs. Easy disposal.

Quart, Gallon and Five-Gallon sizes.

Now in successful use by more than 200 major manufacturers. Details on request.

HEDWIN CORPORATION 1600 Roland Heights Ave., Baltimore 11, Maryland.
Manufacturer of the Hedliner and quality drum liners.

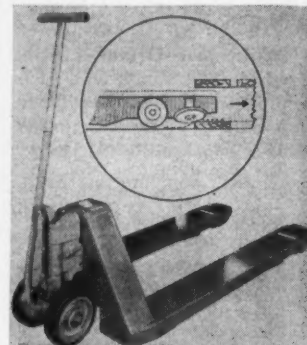
Check 4224 opposite last page

HANDLING & PACKAGING

'Flying saucer' eases entry of fork truck into pallet load

Uses: Helps low-lift pallet trucks make easiest possible entry of truck's fork into pallet.

Features: "Flying saucer" device utilizes principle of an inclined plane to ease climb



"Flying saucer" comes down to earth and is put to work on low-lift truck to make easy entry of fork into pallet

of fork over bottom pallet board. Revolving action helps to position fork into pallet with ease.

Description: Device replaces conventional roller wheels on end of truck.

"Saucer" is standard equipment on manufacturer's Models HX and NX hydraulic hand pallet lift trucks. It also is available on recently improved Model PXG, a battery-powered low-lift pallet truck.

(Models HX, NX and PXG pallet trucks are manufactured by Barrett-Cravens Co., 628 Dundee Rd., Northbrook, Ill.)

Check 4226 opposite last page.

NEXT MONTH

How a manufacturer of chemical raw materials solved a knotty problem of obtaining return payloads for trucks by using collapsible rubber tanks, thereby increasing gross profits nearly \$3000 monthly, makes interesting reading in Material Handling and Packaging section.

"Forget the umbrella, Herman..."

Snap-Tite valved couplings stop flow instantly"

Snap-Tite provides instant shut-off wherever fluid coupling is needed.

Snap-Tite *valved* couplings connect and disconnect quickly and fully—they automatically open line flow when connected; positively seal your line when disconnected—with no "ifs," no chance for human error.

Snap-Tite couplings are available in sizes from 1/4" to 6" ID, in steel, brass, aluminum, 303 ss and 316 ss. Sizes from 6" to 10" ID are available on special order. For more information, write for Snap-Tite catalog #58. Snap-Tite representatives are located in all principal cities.

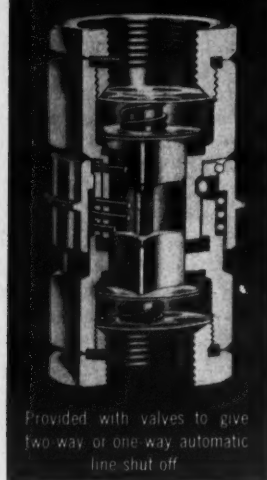
SNAP-TITE COUPLINGS CAN HANDLE ALMOST ANYTHING THAT FLOWS

★
Snap-Tite

SNAP-TITE, INC. • UNION CITY, PA.

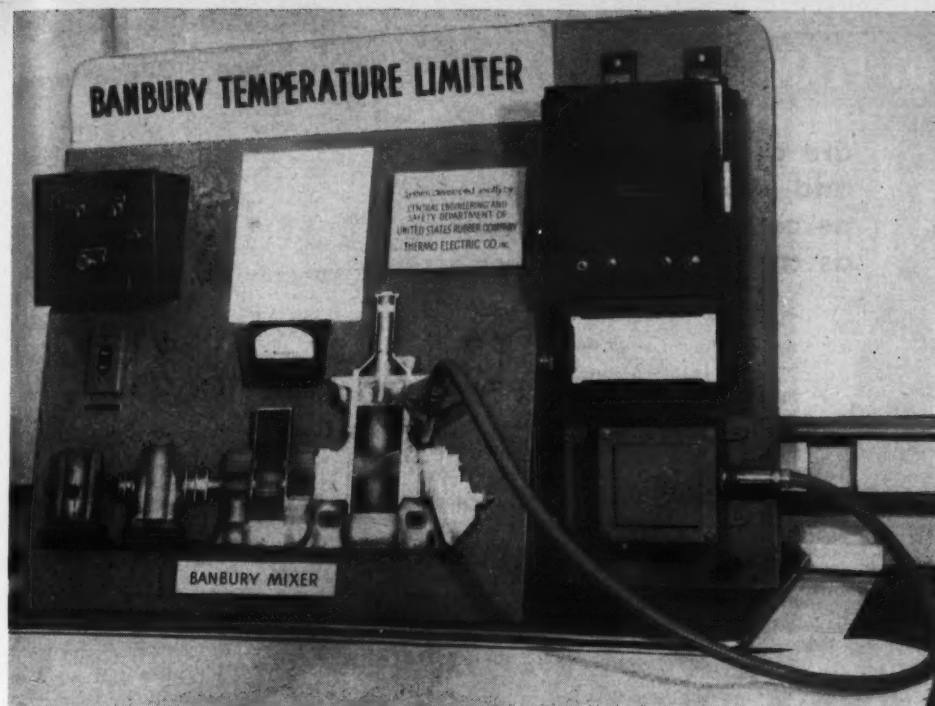
ST-88-01

Check 4225 opposite last page



Provided with valves to give two-way or one-way automatic line shut off

Built to handle high pressure hydraulic and pneumatic systems



Mock-up of instrument installation as made at U.S. Rubber Co. Main instrument (upper right) and temperature indicator (center, under instructions) can be located conveniently to suit individual cases

Flaming gases from an overheated batch of rubber being processed in a Banbury mixer caused four fatalities and precipitated development of a . . .

Temperature Limiter that Ups Safety of BANBURY MIXER OPERATION

THEODORE W. WETT, Associate Editor
with ALAN S. MACLEOD, Central Engineering Dept.
U.S. Rubber Co., New York, N.Y.

Problem: A Banbury mixer fire in 1955, fatal to four men, brought home to management of U.S. Rubber Co., necessity of mixer temperature control. Before this accident, Banbury mixers had not been considered capable of a disaster of such type and magnitude. Safe operation of mixers had not been associated with fact that rubber compounds, when worked above specific critical temperatures, will emit fumes similar in character to natural gas.

It was evident that instruction and training of operating and supervisory personnel

would not, alone, insure against possibility of human failure with potential repetition of the accident.

It was concluded that a single-purpose batch-temperature-monitoring device was needed. By acting to stop mixer motor when an unsafe temperature was reached, device would remove from discretion of an operator decision as to whether danger of fire in mixing chamber existed.

Solution: Based on this conclusion, management of U.S. Rubber Co., requested its Central Engineering and Central Safety Departments to develop,

procure, and install batch temperature monitoring devices for over-temperature protection of production size Banbury mixers within company and its affiliates.

Armed with a definite set of specifications, company canvassed manufacturers of instruments for a commercially available unit. While satisfactory for industrial controls, available devices were not satisfactory for this specialized purpose.

It required two years of intensive collaborative engineering effort with an instrument manufacturer to develop and test a satisfactory unit. Resulting device has these characteristics:

1. A thermocouple type pyrometer with a probe designed

to employ method of sensing mixing chamber temperatures common to Banbury temperature recorders. Thus operator's recording instrument would be showing identical temperature being monitored by temperature limiting device.

2. Transistorized to eliminate need for vacuum tubes and with a minimum of moving parts.

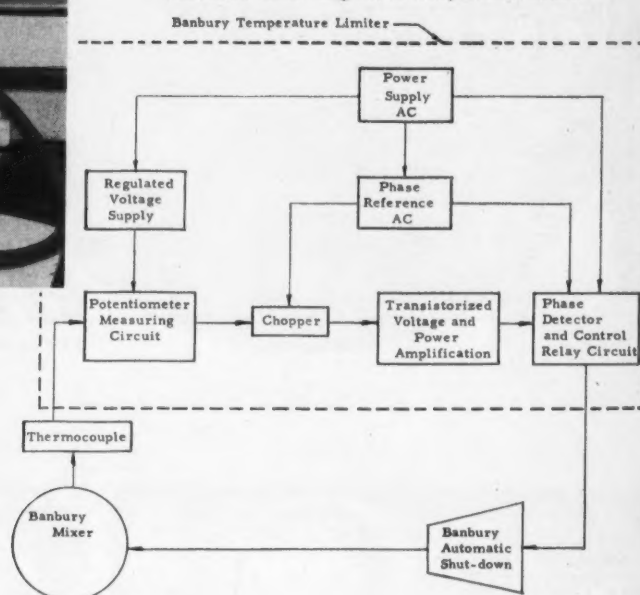
3. To fail safe in event of component failure by automatically stopping mixer.

4. Enclosed in dust-resistant, locked case so that adjustment is possible only by authorized personnel and unit resists impact and vibration.

5. Easily checked manually for operating condition with plug-in features for rapid re-

To next page

Functional block diagram of temperature limiter



BRIGHTON LAB

AND PILOT PLANTS



are designed to simulate and produce the same percentage of conversion as commercial counterparts

"Look Before you Leap" at the precise results you can obtain from a pilot plant by BRIGHTON, before you move into full scale production of a product. Brighton Pilot Plants produce data consistent with commercial operations, save you time and money. Stainless Steel construction provides physical strength at operating temperatures; is corrosion and oxidation resistant, and prevents contamination which could affect control equipment, product purity, product distribution and catalyst activity. Write For Catalog.

BRIGHTON

METALSMITHS
EST. 1914



CORPORATION
820 STATE AVENUE • CINCINNATI 4, OHIO

Check 4227 opposite last page

INSTRUMENTS & LAB

From preceding page

placement in event of failure.

Output produced by thermocouple is fed into potentiometer, bridge-type measuring circuit. Next it is converted into AC and amplified. It then goes through a phase detector and finally to control relay circuit.

When output of thermocouple exceeds that of the pre-selected temperature, relay functions to signal over-temperature and stop mixer. Relay functions at null-balance point. Any failure of thermocouple, circuit connections, power supply, or instrument components will automatically stop mixer.

Each plant sets up a standing committee called the Banbury Safety Committee. This committee includes representatives from production, laboratory, engineering, and safety departments who are given the responsibility for establishing maximum safe temperature for each mixer. Rather than have a specific temperature for each compound, an overall safe temperature is established to cover all compounds mixed in any one machine.

Periodic inspection and testing of each temperature limiter installation is mandatory. Plant safety supervisor witnesses a Banbury mixer shutdown by running a test batch up to pre-set maximum safe temperature. All setting, inspection, operating, and maintenance procedures are precisely regulated and enforced.

Average cost of limiter installation, including necessary equipment and plant installation costs, ranged from \$1500-2000.

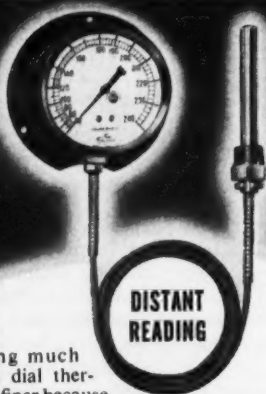
Results: United States Rubber Company has now installed 71 Banbury temperature limiters for protection of sizes 3A, 9, 11, and 27 mixers. Installations completely eliminate arbitrary operator decisions on when a unit is unsafe. Chances for human error are eliminated to as high a degree as possible.

(Banbury temperature limiter is a product of Thermo Electric Co., Inc., Saddle Brook, New Jersey.)

Check 4230 opposite last page.

CHEMICAL PROCESSING

The dial thermometer at its best



Something much finer in a dial thermometer: finer because it is the bourdon tube type of thermometer at its best...embodies the greater precision and lasting accuracy of the Marsh Pressure Gauge.

Both vapor tension and gas-filled types are available in either distant reading or rigid stem types. In the broad Marsh line you have a complete selection of temperature ranges, case sizes, styles, and finishes.

Ask for the Thermometer Catalog

MARSH

MARSH INSTRUMENT CO. Sales Affiliate of Jos. P. Marsh Corp.

Dept. Z, Skokie, Ill.

Marsh Instrument & Valve Co., (Canada) Ltd.
8407 103rd St., Edmonton, Alberta, Canada
Houston Branch Plant, 1121 Rutledge St.
Sect. 15, Houston, Texas

Check 4228 opposite last page

ELECTRONICS-TIME

Lumenite

AUTOMATIC CONTROLS

- ELECTRONIC LIQUID LEVEL
- INDUSTRIAL TIMERS
- TIME SWITCHES
- MAGNETIC SWITCHES
- ELECTRONIC SWITCHES

For Complete Information and Prices on Equipment Needed
Write For Any Bulletin Listed Below.

LT—Time Switches	FL—Liquid Level	ITC—Ice Thickness
PC—Program Clocks	FM—Milk Level	BH—Boiler Level
CR—Cycle Repeaters	FN—Nonconductive Liquid	MV—Motorized Sanitary Valves
R—Time Delay Relay	RMC—Automatic Reset	IT—Interval Timers
LAS—Auto-Lawn Sprinklers	LEE—Photo-electronic Relays-Counters, Etc.	

LUMENITE ELECTRONIC CO.

ENGINEERS • DESIGNERS • MANUFACTURERS

407 South Dearborn Street Chicago 5, Illinois

Check 4229 opposite last page

THAT'S INTERESTING

Smog log?

A worldwide catalog of smog particles has been advocated by Prof. Albert F. Bush of UCLA. Such a catalog, compiled by microscopists, could take much of the guesswork and duplication out of current research in air pollution control.

Purify plastics

A process to render plastic materials bacteriostatic has been developed by Puratize Inc., subsidiary of Gallowhur Chemical Corp. Process involves addition of minute quantities of custom-made bacteriostats to resin, colorant, or plasticizer.

Poison ivy goodbye

Compound in tablet form, gives immunity to poison ivy, oak, and sumac for a period lasting up to 10 months. Made from an extract of poison ivy leaf, the prophylaxis provided immunity for 95% of 254 Coast Guardsmen heavily exposed to the dreaded creeper. (Central Feature News, Inc.)



American Cyanamid
CONTROLS BOILING-POINT RISE
WITHIN 1/20th DEGREE C...

by unique narrow-span **DYNALOG*** Electronic Controller

Temperature difference control within $\frac{1}{2}$ of 0.1°C — that's what American Cyanamid demands for process evaporators at their Organic Chemicals Plant in Bound Brook, New Jersey. Boiling-point rise must be held at 108.5°C , since even slight variations affect product quality.

A Foxboro Dynalog Recorder-Controller, with full-scale span of only 5°C , provides the close control American Cyanamid requires. Control is held continuously within $1/20$ th of a degree of set point — with chart records for proof.

Cyanamid's Narrow Span Controller was installed in 1955. It's been running continuously ever since,

virtually unattended. The only servicing or maintenance required on the Dynalog has been re-inking and chart changing.

Get the complete story on the exclusive Dynalog Controller, with full-scale spans as narrow as 5°F — the narrowest span available to industry today! Write for Bulletin 20-10. The Foxboro Company, 813 Norfolk St., Foxboro, Mass. *Reg. U. S. Pat. Off.

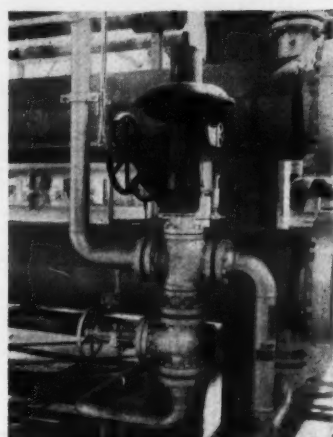
FOXBORO
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DYNALOG ELECTRONIC INSTRUMENTS

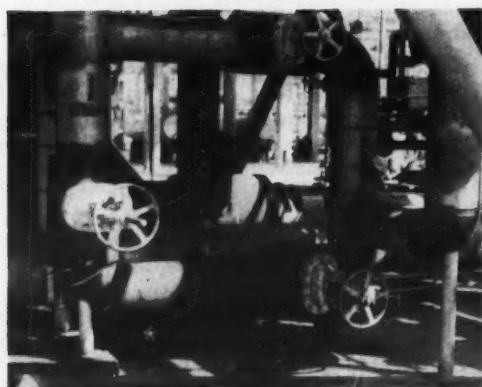
Check 4231 opposite last page



Crude Charge to Furnace



Reactor Effluent Flash Drum Control



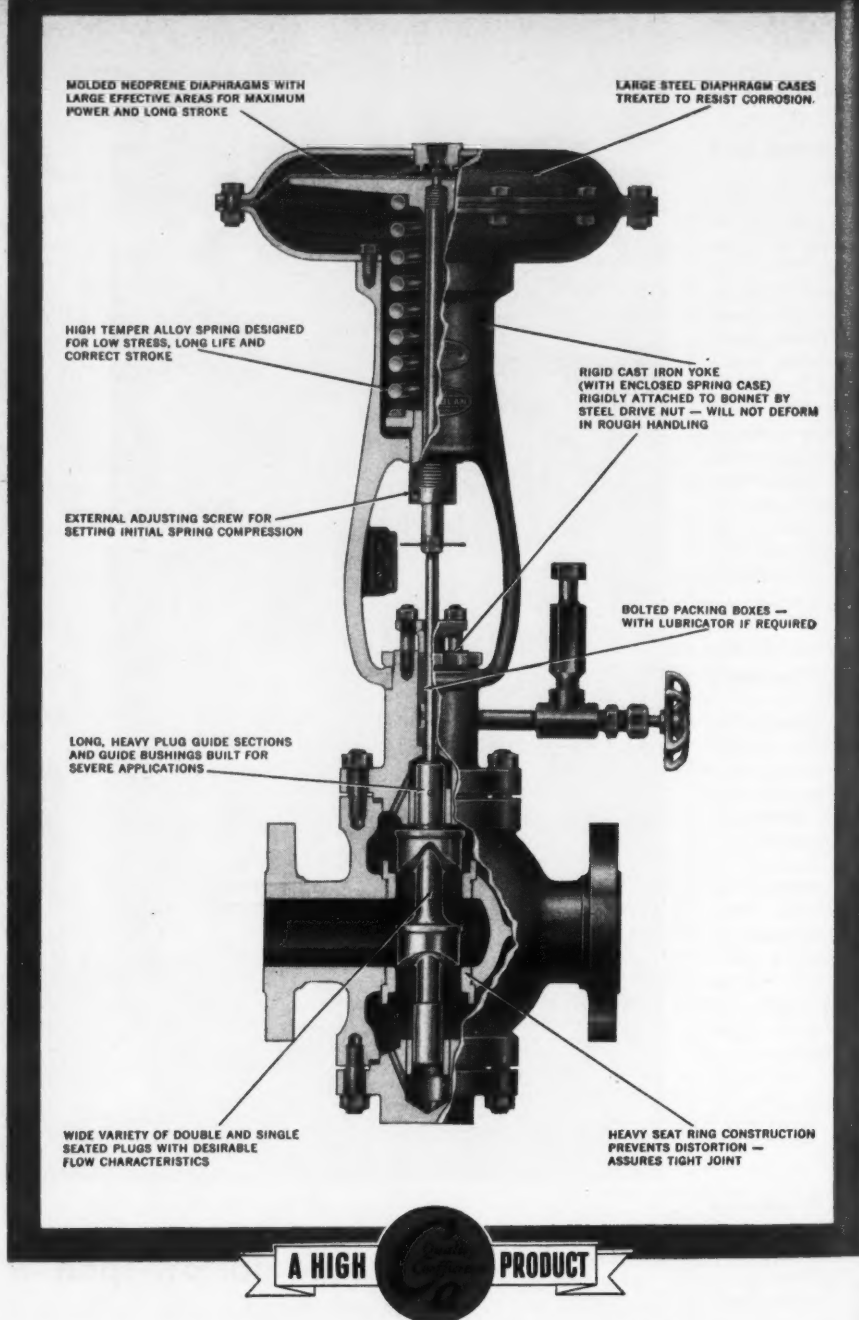
Cat-Cracker Feed Control



Gas to Fuel Drum and Flare Drum



Debutanizer Bottoms Control



In the Final Control Element . . .

ACCURACY AND DEPENDABILITY ARE KEY QUALITIES

**That's Why So Many Process Plants
Standardize on Masoneilan Control Valves**

Many process control systems — in chemical, paper, petroleum, petrochemical, textile and other plants — use Masoneilan Control Valves exclusively because experience has proved that Masoneilan valves are accurate and dependable. And because they give this top performance over long periods, they are most economical.

The wide variety of applications pictured here

are in one modern petroleum refinery which uses Masoneilan valves. There are Masoneilan types for practically all control systems in all other processing plants, too. If you are concerned with the selection of control valves, it will pay you to consider Masoneilan.

Complete details on control valves for every process use are yours for the asking. Write for catalog.

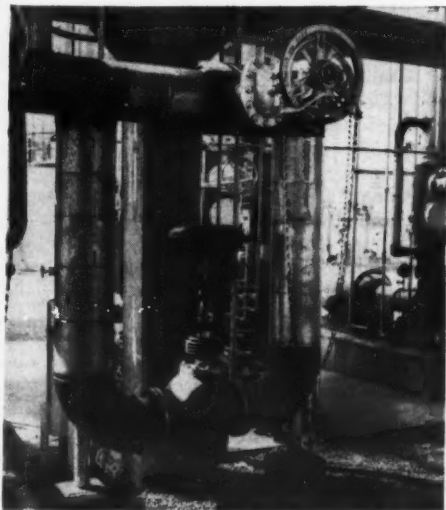
MASON-NEILAN

A Division of Worthington Corporation

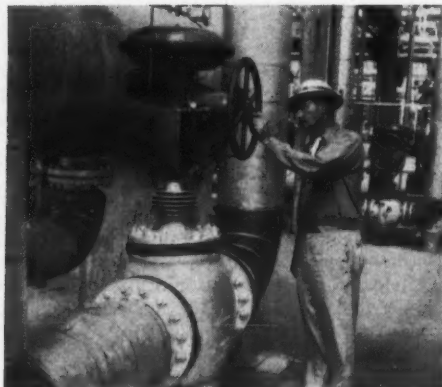
25 NAHATAN STREET, NORWOOD, MASSACHUSETTS

District offices or Distributors in principal cities in U.S.

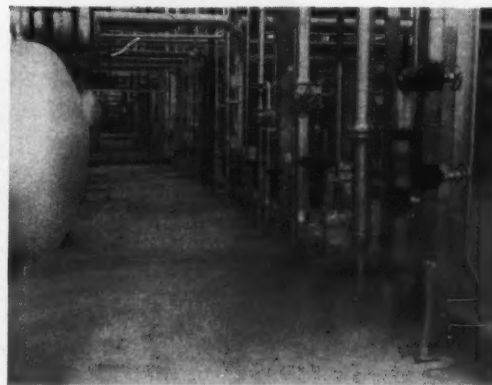
In Canada: Mason-Neilan, Division of Worthington (Canada), Ltd.



Feed to Storage in Cat Cracker



Effluent Control in Cat Cracker



View of Cat Reformer using Many M-N Valves

Check 4232 opposite last page

PANDUX THERMOMETERS

Write for
FREE
temperature conversion
chart... C to F and F to C
0°K. to 5612°F.

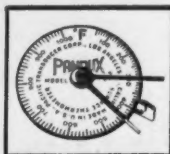
CHECK *any*
SURFACE TEMPERATURE!



SPOT-CHECK All Stainless Steel. Four ranges to 1000°F. With magnet. \$4.00



SURFACE Three Ranges, minus 50°F. to 370°F. Also in Centigrade. With magnet. \$6.75



MAXIMUM-MINIMUM All Stainless Steel. Four ranges to 1000°F. With magnet. \$6.75



HI-HEAT Two Built-in Magnets. 50°F. to 750°F. \$6.75



PIPE For Pipe up to 2" NPT. Minus 50°F. to 250°F. or 70°F. to 370°F. With spring clip. . . \$6.75



SURFACE PYROMETER 10" Surface Tip. Two ranges to 2300°F. Complete. \$57.00

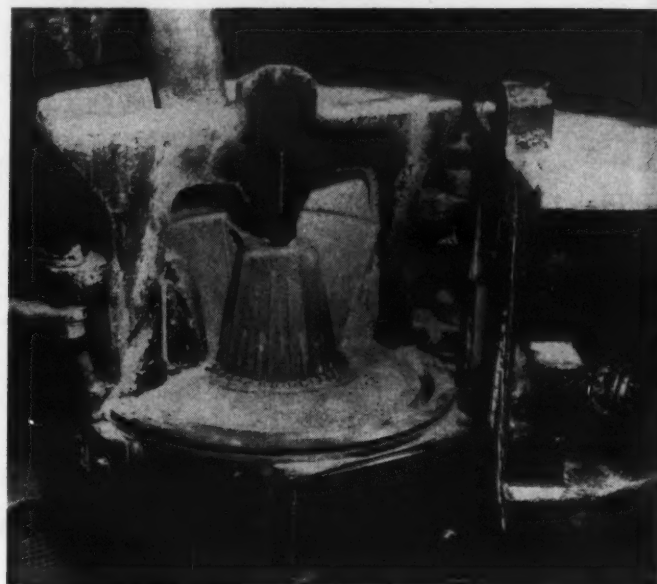
OTHER PANDUX THERMOMETERS: Stainless Steel Stem Dial Type regular and with maximum-minimum hands; Glass Mercury Immersion Types for production and laboratory.

Order through your dealer or write factory for complete catalog CP-39

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Los Angeles 64, Calif.

Check 4233 opposite last page

PROCESS INSTRUMENTATION and LABORATORY APPARATUS



Sampler, one of two used at Westvaco, produces a thoroughly mixed, homogeneous, representative portion of phosphate stream. It has operated for six years without downtime or replacement of parts

"Imagineering" in sampling phosphate product streams for laboratory analysis at Westvaco has resulted in . . .

Better phosphate quality control by using crusher-sampler

Problem: Hand sampling of phosphates for quality control analysis was slow and not reliable enough for quality minded management at Westvaco Mineral Products Div., Carteret, N.J. Pulverizers were used for a time but proved inadequate for producing fine size reduction necessary for proper lab analysis.

Tripolyphosphates and tetrasodium pyrophosphates are sampled and analyzed carefully prior to shipment in order to assure product quality and uniformity. Burgeoning markets for detergents and water treating compounds, coupled with increasing competitive activity, made close quality control imperative.

Solution: To replace pulverizers, Westvaco installed two automatic coal samplers to serve as crushing and sampling units for phosphates. Machinery, initially developed for mining and power industries, samples a fraction of process stream. Of this fraction, a 10% increment is diverted to sample cans for laboratory analysis.

Phosphates are fed into a hopper where

they are gripped by a revolving coarse crushing nut and roughly crushed against top liners. They are then gravity-passed to revolving, fine-toothed crushing disc and stationary liner where crushing operation is completed.

Because of this gradual reduction process (product is not discharged after rough crushing but further subjected to rotating and continually crushing actions), sample is thoroughly mixed.

Handwheel adjustment permits fine or coarse grinding. Westvaco utilizes fine-grinding adjustment to obtain minuscule particles for more efficient, easier laboratory analysis.

After 10% sample is discharged at periphery of rotating disc, balance of fine-ground phosphates are passed back into product stream through a larger, inclined spout. Unit could be adjusted to deliver 5 or 15% samples by changing ejection spouts. Crushing nut and top crushing liners can be replaced easily and inexpensively if needed. Open-door arrangement of crusher-sampler permits access

GOT THIS CATALOG?



MANZEL

Here's the most complete, most useful catalog on metering pumps ever published. Lets you select the exact unit you need to meet any requirement. Ask your Manzel field engineer . . . or write direct for YOUR FREE COPY.



Specialists in metering pumps and lubricators since 1898

274 Babcock Street
Buffalo 10, N. Y.

Check 4234 opposite last page

to all movable parts in minimum time.

Samplers operate at 160 rpm, without vibration. They require approximately 3 hp.

Main product stream undergoes calcining. After a four-hour drying cycle, material is either bin-stored or packaged. Based on laboratory results, material is stored according to pre-designated specification requirements of customers.

Results: Homogeneous, finely disintegrated and truly representative samples of product are supplied to the laboratory. Lab personnel can perform accurate reproducible analyses to assure product uniformity and compliance with specifications.

Only maintenance required on units has been routine cleaning and lubrication which is made part of overall plant maintenance scheduling. Samplers have performed their job successfully for six years with no downtime and no parts replacement.

(Coal samplers are a product of Sturtevant Mill Co., Boston 22, Massachusetts.)

Check 4235 opposite last page.

Temperature is uniform in humidified incubator

Uses: For biochemical experiments and culture work as well as package and age testing.

Features: Humidified incubator has temperature uniformity within plus or minus $\frac{1}{2}^{\circ}\text{C}$ in every area of working chamber.

Description: Humidity range of unit includes 30% to 98% RH. Wet and dry bulb thermostatic control and direct-reading hygrometer are provided.

Visual monitoring of 25-cu-ft work chamber is made easy by full-length door window. Available in models for recessed mounting or equipped with refrigeration.

(Humidified incubator is development of Electric Hot-pack Company, Inc., 5033 Cottman Ave., Philadelphia 35, Pennsylvania.)

Check 4236 opposite last page.



continuous

automatic

chemical

analyses

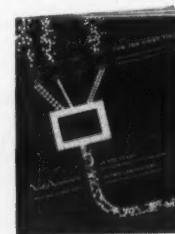
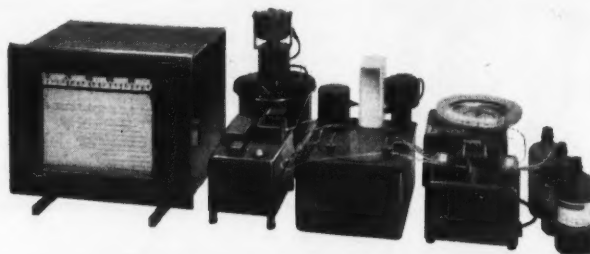
with the



A single control system, the AutoAnalyzer provides highest precision quality control through continuous analyses of main stream production. You achieve product standardization at the highest level by controlling all process variables at the critical stage. It does away with slow, inaccurate, and expensive manual laboratory procedures. Integration of the Technicon AutoAnalyzer into your process stream insures product quality and production scheduling while eliminating the need for reruns.

The AutoAnalyzer is currently in use as a production control system in such diverse applications as pharmaceuticals, sugar and syrups, and boiler feed waters.

Designed for simple, foolproof operation on the line or in the lab, the AutoAnalyzer requires no sample preparation or measurement. Completely self-cleansing, the system brings true automation to chemical analysis for the first time.



TECHNICON CONTROLS, INC.

211 Saw Mill River Road

Chauncey, New York

Send for your free copy of this eight-page descriptive brochure plus detailed application data.

Check 4237 opposite last page

INSTRUMENTS & LAB

Toughened counter tops resist many chemicals

Carbonizing formula uses seven applications

Uses: As counter tops suitable for laboratory work benches or desks.

Features: Tests indicate the wooden counter tops are non-reactive with many common laboratory chemicals.

Description: Wood counter tops can be either birch or maple. A carbonizing formula is then applied, including six chemical coatings and a wash coat to protect against chemicals. Tops are non-reactive with acetic, formic, chromic or 20% hydrochloric acids, ethyl or butyl alcohols, formaldehyde, acetone, ether, toluene, gasoline, mineral oil, hydrogen peroxide or chlorine gas.



Carbonized counter tops resist many common chemicals

Separate tops are available. Or entire laboratory desks, built to specification, may be supplied.

(Carbonized counter tops are product of Hyde-Murphy Co., Ridgway, Pa.)

Check 4238 opposite last page.

Clamp ammeters that measure both AC and DC are pictorially presented in eight-page catalog. "Tong Test Ammeters"—Columbia Electric Mfg. Co., 4519 Hamilton Ave., Cleveland 14, Ohio.

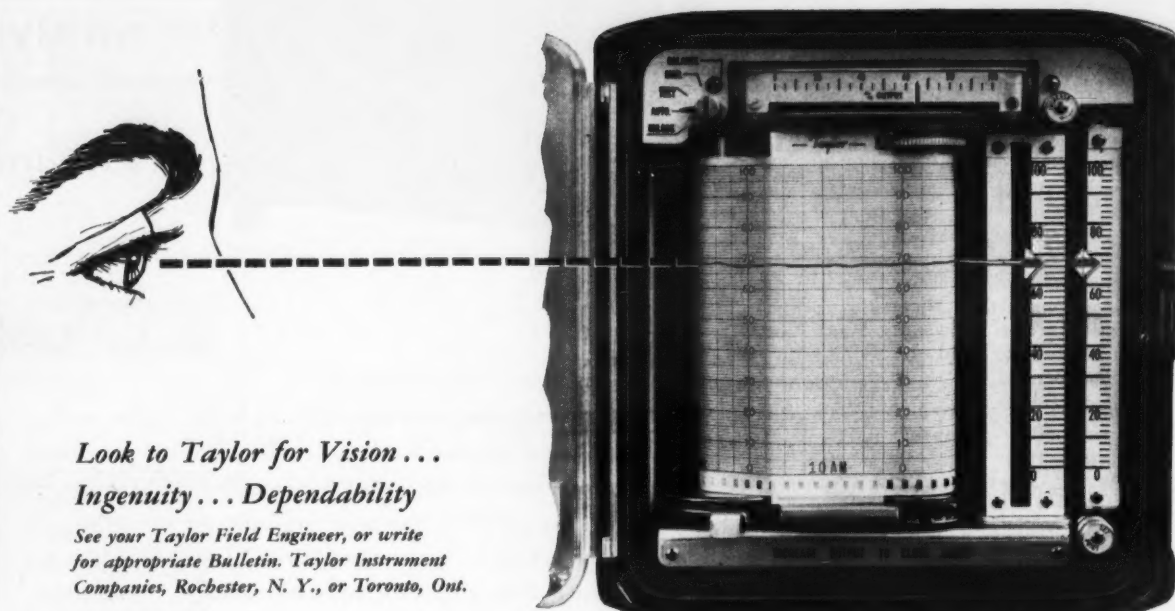
Check 4239 opposite last page.

Industrial TV system is described in illustrated two-page "1987 Television System"—Kin Tel Div. of Cohu Electronics Inc., 5725 Kearny Villa Rd., San Diego 12, California.

Check 4240 opposite last page.

UNCONFUSED

in both Electronic and Pneumatic



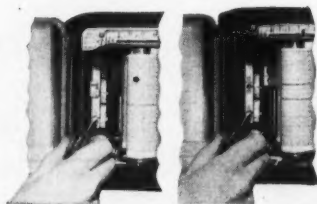
701J AC or DC Electronic Recorder

Look to Taylor for Vision...

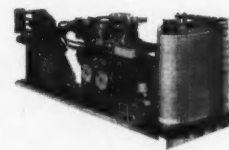
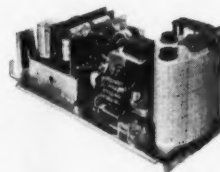
Ingenuity... Dependability

See your Taylor Field Engineer, or write for appropriate Bulletin. Taylor Instrument Companies, Rochester, N. Y., or Toronto, Ont.

Compare these features . . . common to the 701J Electronic



1. A Taylor 'first'. On both Electronic (left) and Pneumatic (right) instruments, controller response adjustments are quickly and easily made from the front, where results can be watched. You can visualize immediately all pertinent process information—chart, pen and set-point.



2. All major components plug in. Even individual amplifier circuits plug in. You can service all components and still stay on control. AC and DC Recorders are completely transistorized; unaffected by a supply voltage change up to $\pm 10\%$.

Taylor Instruments

READABILITY

instrumentation by Taylor

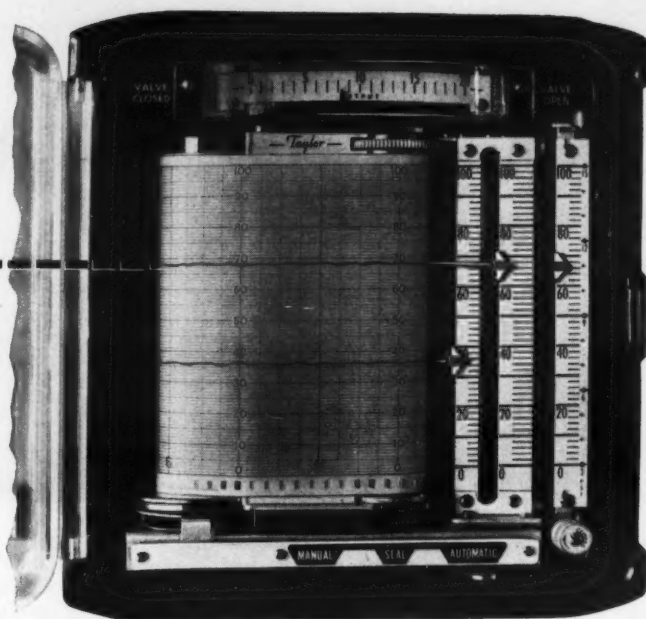
- Simplest scanning of all . . . because chart record, pen and set-point are side-by-side.

- Invites frequent reading . . . because target-type pens and pointers are easiest of all to see, even at a distance.

- Operators make fewer mistakes . . . because all pertinent data is lined up.

- You read the 4" chart from left to right—like a newspaper—on rectangular coordinates.

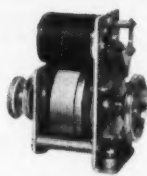
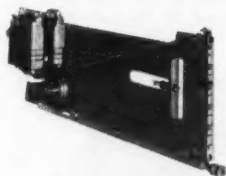
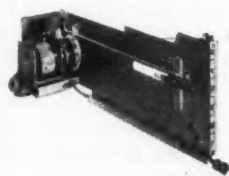
- All these features in a 6" x 6" cutout.



*Reg. U.S. Pat. Off.

90J TRANSCOPE* Pneumatic Recorder

AC or DC Recorder and the 90J TRANSCOPE Pneumatic Recorder



3. Plug-in Set Point Transmitters, parallel to and exactly matching chart range, permit comparison without confusion and accurate adjustment of the control point. They can be removed for checking with only momentary interruption of record.

4. Powerful Servo Motors give more precise pen positioning than ever before. More accurate records. Unmatched threshold sensitivity. Unparalleled power permits use of process alarms, new inking system and elimination of flimsy linkage.

MEAN ACCURACY FIRST

Check 4241 opposite last page

INSTRUMENTS & LAB

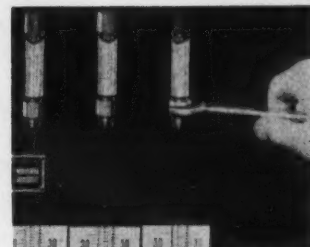
Over-range check valve handles slow creeping, violent surges

Suitable for pressures to 500 psig

Uses: As manometer check valve to prevent loss of indicating fluid and any over-range condition.

Features: Check valve does not affect manometer response and accuracy.

Description: Manometer check valve can be used with all manometer indicating fluids. "Air blocking" is pre-



Manometer check valve protects instrument

vented because maximum discharge is permitted until instant indicating fluid enters valve. Teflon float causes tight closure of specially designed stainless steel valve. Only 3 3/4" long and 5/8" in diameter, valve can be used on single-tube or on each tube of multiple-tube manometers. Connections are 1/4" NPT.

(Manometer check valve is product of The Meriam Instrument Co., 10710 Madison Ave., Cleveland 2, Ohio.)

Check 4242 opposite last page.

Membrane filter and holder used in dust and aerosol analysis is discussed in five-page booklet. "The Aerosol Membrane Filter" — Gelman Instrument Company, 233 Jefferson Street, Chelsea, Mich.

Check 4243 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

INSTRUMENTS & LAB

Frictionless, liquid-free flow transmitter is versatile

Measurement of differential-pressure variables given

Uses: For measuring flow, liquid level, or any other variable which is a function of differential pressure.

Features: Transmitter has no torque tubes, stuffing boxes, knife edges, or bearings. Only sensing unit is single-element bellows. No liquid (mercury or other) is used.

Description: Unit is designed for use with Hays Universal recorder. Together, the two instruments form system to measure, indicate, and/or record differential pressure. It is available in ranges from 20 to 600" water differential. Equalizing and shut-off valve assembly is self-contained in housing. Unit can be mounted on vertical 2" pipe or on wall with available bracket.

(Model 245 flow transmitter is a product of The Hays Corporation, Michigan City, Ind.)

Check 4245 opposite last page.

Direct digital print-out from recorder

Can control a card-punch machine for computing

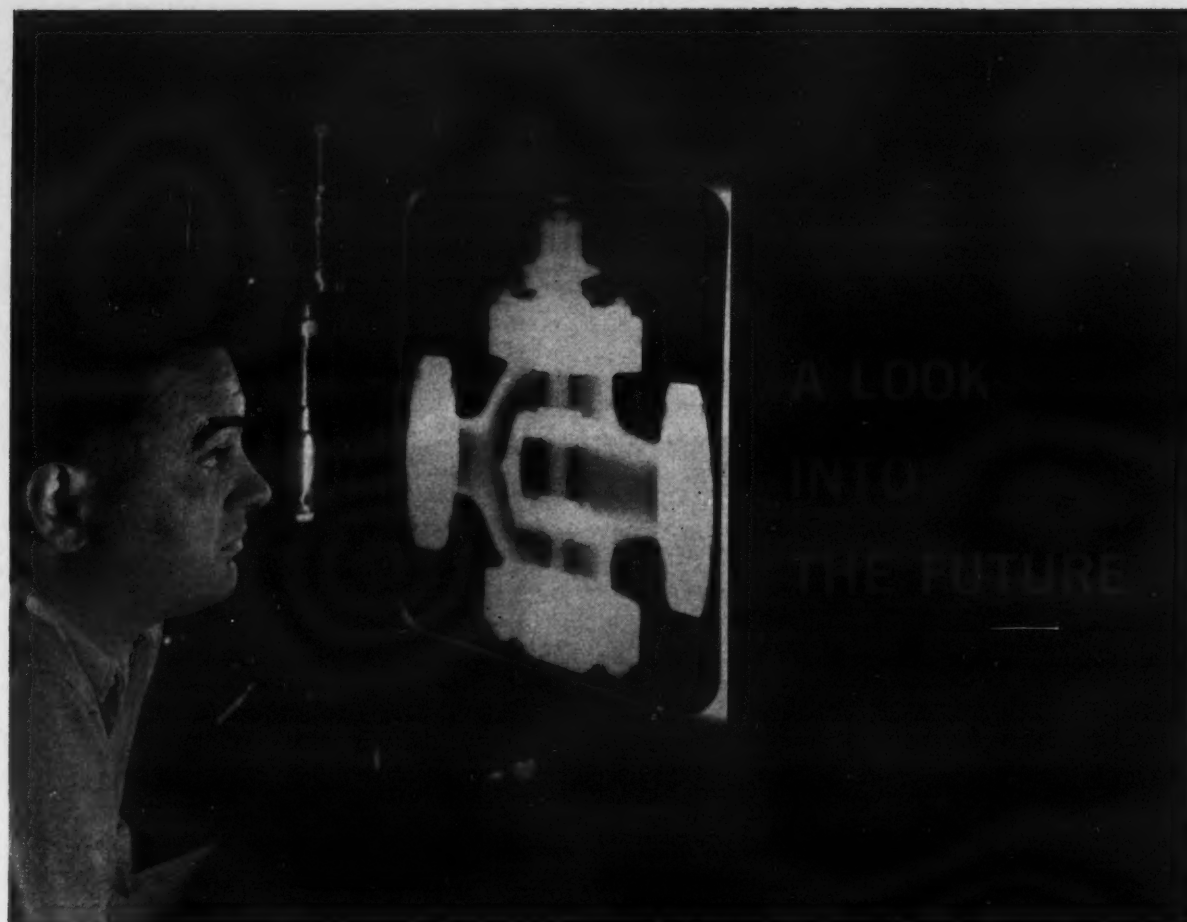
Uses: For analog to digital conversion, indication, recording and controlling; and for controlling card-punch machine for subsequent use in computing and data processing equipment.

Features: Provides direct reading and print-out in digital form.

Description: Dimensions are 21-9/16 x 14 7/8 x 11 1/4". Unit has printing cycle of 3 seconds and longer, is accurate to 1/2%. Input signal is 0-100 mv. Response time, 0 to full scale, is 3 seconds.

(RAC Model 457 digital recorder is a product of Research Appliance Company, Route 8 at Craighead Road, Box 307, Allison Park, Pa.)

Check 4246 opposite last page.



Neither stargazer nor mystic, this K & M technician can nevertheless see into the future. His crystal ball is a small mass of radioactive Iridium; his fortune-telling cards, gamma-ray pictures of critical valve assemblies. With these pictures he searches out the kind of subtle flaws and tiny imperfections that could become trouble spots at some future time. And so he is able to predict and prevent in-service failures and malfunctions.

Radiographic inspection is just one way in which K & M works to insure a long and healthy service life for its products. K & M's in-plant quality control facilities range from a contour comparator, for precision checking of small parts, to a 4000-gpm flow test loop, where sample valves from the production line are tested for on-stream performance. Micrometer and calipers play an important part, too, for each K & M valve is subjected to

more than eight hundred dimension check-outs before it reaches the shipping crate. It's either perfect, or "no go."

K & M's meticulous standards of quality control are neither myth nor magic . . . just good business — for us, and for you.

For a more detailed view of our plant and production practices, send for the well-illustrated, informative brochure, "This Is K & M."



K&M

diaphragm control valves

Our 79th Year



KIELEY & MUELLER, INCORPORATED

Oldest Pressure and Level Control Valve Manufacturer
64 Genung Street, Middletown, New York

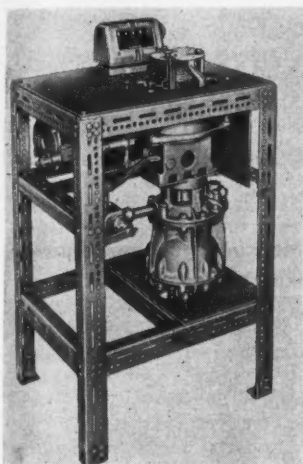
Check 4244 opposite last page

INSTRUMENTS & LAB

Controls flow rate within 1/4 of 1% accuracy

Uses: For liquid handling operations requiring the dispensing of a specific number of gallons per minute in a given period of time.

Features: Unit controls the rate of flow within 1/4 of 1% accuracy regardless of variations in pump pressures or liquid viscosities.



Maintains continuous and constant control of rate of flow

Description: Positive control is made possible by special control nut assembly, which synchronizes a constant speed motor, valve, meter, and variator. Wide range of capacities can be controlled, from 1/2 to 250 gpm. Each unit is equipped with a variator dial for control settings. Meter can be furnished in stainless steel.

(Rate-of-flow controller is product of Meter Div., Bowser, Inc., 1300 E. Creighton Ave., Fort Wayne, Ind.)

Check 4247 opposite last page.

NEXT MONTH

When it comes to complicated, exacting product assay, pharmaceuticals are among the most difficult to contend with. To learn how Endo Laboratories uses low-cost infrared to ride herd on product quality, see next month's Instrumentation section.

film processing demands complete dependability and corrosion resistance

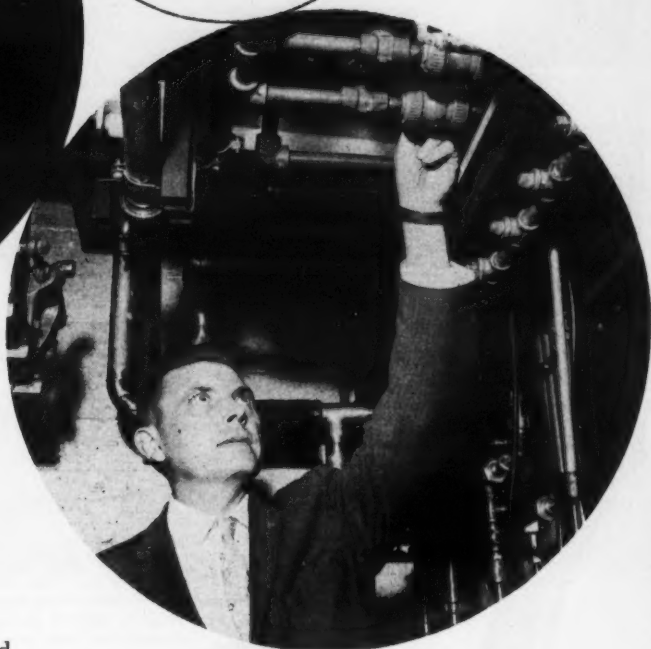
"One of the most dependable
'no maintenance—no leakage' valves
we've found in 21 months of 'round
the clock service,"

states Ed Reichard, Chief Engineer, Consolidated
Film Industries, Hollywood, California.

Hundreds of thousands of dollars are represented in the original negatives processed for motion pictures by Consolidated Film Industries. Failure of the processing equipment can result in damage to these valuable negatives. C.F.I. processing equipment handles highly corrosive solutions such as ferricyanide bleach used in processing color film. To insure against failure in its equipment, Consolidated Film Industries specifies Chemtrol plastic ball valves.



BALL VALVE



CHEMTROL manufactures plastic piping systems equipment for corrosion-service. We have available a complete family of plastic valves with outstanding flow characteristics and service life. CHEMTROL equipment is constructed of the latest polymers developed for specific industrial needs. These include PVC (polyvinyl chloride) Type I and II; Kralastic[®]; Penton[®]; Profax[®] (polypropylene). Other CHEMTROL products include CHECK VALVES, BALL COCK VALVES, METERING NEEDLE AND GLOBE VALVES. If you are an engineer designing plastic piping systems, send for our new handbook #159, using coupon below. * Hercules Powder Co. ** Naugatuck Chemical Co.



—Plastic piping systems
equipment for corrosion service

Distributor stocks nationally

CHEMTROL

10872 STANFORD AVE., LYNWOOD, CALIFORNIA
NEvada 6-0837

CHEMTROL

10872 STANFORD, LYNWOOD, CALIF.

Gentlemen

Please send us your new handbook #159 for
design of plastic piping systems.

Name _____

Position _____

Company _____

Address _____

City _____ Zone _____ State _____

Check 4248 opposite last page

DEKORON PROTECTO-PAC

Advantages of Dekoron all-plastic instrument tubing harness are now four-dimensional. You get, in addition to its inherent lower-cost installation . . . chemical . . . impact . . . fire resistance.

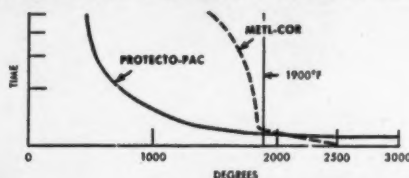
And the advantages of Dekoron Protecto-Pac multiply the closer you examine them. For example, you can get Protecto-Pac in many forms to suit your requirements exactly — from stock.

If there is danger from weld splatter, sparks or a potential fire hazard — order Dekoron Protecto-Pac Type FB. If you wish to bury it underground — specify low-cost Protecto-Pac Type B. Both types supplied with virtually any number of individual tubes, and also with new metal armor protection.

You can pay more but you can't buy better, longer-lasting instrument line harness than Dekoron — America's Premier Instrument Tubing Line.

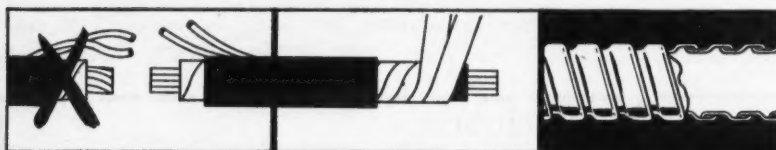
AA-8885

TYPE FB FOR FIRE AND IMPACT RESISTANCE



FIRE RESISTANCE
of copper tube bundles is superior up to 1900°F; less pronounced from 1900° to 2500°F. Above 2500° Protecto-Pac Type FB is superior to copper tube bundle.

TYPE B FOR UNDERGROUND BURIAL



NO "CORKSCREW" effect, as with twisted tubes, because tubes lie straight in bundle to give faster, neater individual tube take-offs.

NEW IMPROVED INSULATION is composed of two wraps of asbestos tape bonded to backing of Mylar® for maximum protection.

DEKORON PROTECTO-PAC Type FB or Type B can be supplied with 24 gauge galvanized steel armor of modified square-lock construction with cord packing for maximum strength and flexibility.



QUALITY • RESEARCH • SERVICE

SAMUEL MOORE & COMPANY • DEKORON PRODUCTS DIVISION • MANTUA, OHIO

Check 4249 opposite last page

INSTRUMENTS & LAB

Thermocouples designed for rigorous service

Uses: In metal combinations such as copper-constantan for temperatures down to -300°F and rhodium-platinum for temperatures over 1600°F .

Features: Thermocouples are designed to meet severe demands required of controls and instruments for rocket engines, melting furnaces, nuclear reactors, and processing of liquid hydrogen, fatty acids, other difficult-to-handle materials. Conductors are encased in specially processed ceramics and surrounded by chemically clean metal sheaths.

Description: Insulation resistance between wires and sheath ranges up to 100 megohms at 500v DC; dielectric strengths to 2000v AC.

(Con-P-Pak thermocouples are manufactured by Continental Sensing, Inc., 1950 North Ruby St., Melrose Park, Illinois.)

Check 4250 opposite last page.

Checks and calibrates process controllers

Portable unit combines several test functions

Uses: Checking, installing, or servicing potentiometers and allied process control equipment.

Features: Test instrument has two millivolt ranges. These calibrations permit measurement of thermocouple outputs,



Portable test set provides all necessary test convenience.

thermoconverters, radiation receivers, all in one instrument.

Description: Portable instrument is combined precision signal source, full potentiometer, and milliammeter. Being completely self-contained, the instrument provides all facilities, accuracy, and convenience necessary for testing.

Instrument has been designed to provide absolute millivolts with an accuracy of $\pm 0.10\%$. A built-in standard cell is used as primary reference.

(Taylortest I is product of Taylor Instrument Co., 95 Ames Street, Rochester 1, New York.)

Check 4251 opposite last page.

Measures true mass flow without moving parts

Uses: Instrument protects catalyst bed in chemical process which requires uninterrupted gas flow.

Features: Having no moving parts, instrument utilizes platinum resistance elements to give a direct measurement of true mass flow independent of temperature or pressure of gas.

Description: Mass flow transducer has range from 20 to 180 lb of air/minute in a 6" duct. Transducer provides a 100 microampere output signal as a function of the mass flow of air or other gas over operating temperatures from 40 to 150°F .

Unit consists of two platinum resistance probes which form active elements in opposite arms of a D-C resistance bridge. Probes extend into flow stream from case which houses passive bridge elements and a zener diode voltage regulator circuit. Longer probe is heated by a relatively high steady-state current, and makes the fundamental density-velocity measurement as it is cooled by the mass flow in duct. Shorter probe is unheated, and provides compensation for changes in output of heated probe as a function of gas temperature.

INSTRUMENTS & LAB

Specifications are: Input, 28 volts DC; Weight, less than 1 pound.

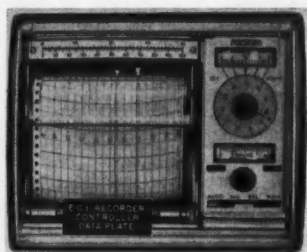
(Mass flow transducer is product of Trans-Sonics, Inc., Burlington, Mass.)

Check 4252 opposite last page.

Electronic controllers utilize solid-state components

Reduces size and minimizes maintenance

Line of electronic control instruments for process work — including transmitters, controllers, and recorders — is based on solid-state physics. This reduces size of units and helps them to operate for longer periods without need for maintenance.



Recorder-controller requires minimum space

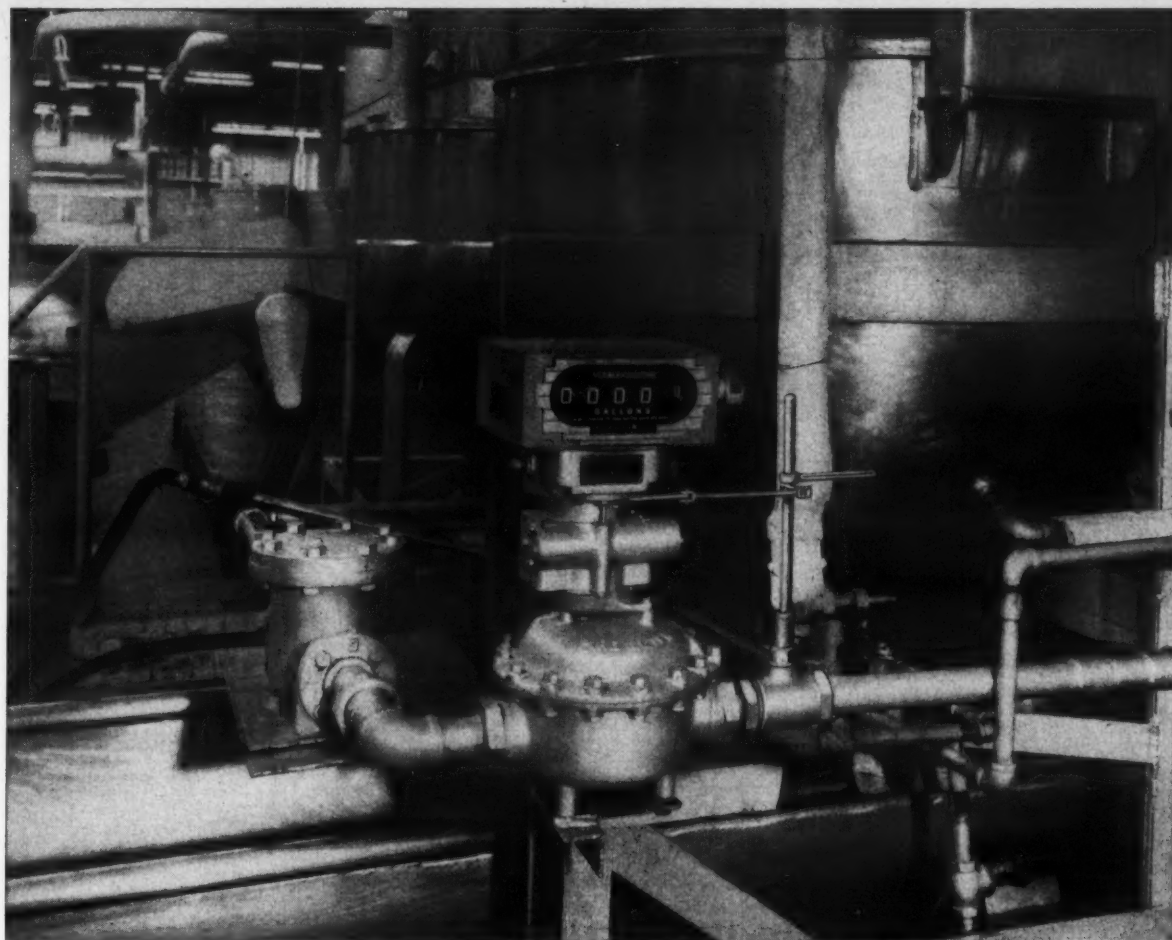
For example, transmitters are tubeless. They are of motion-balance design and transfer field measurements of pressure, flow, liquid level, or temperature to panel-mounted receivers.

Controllers also have no vacuum tubes. They have plug-in sub-assemblies for simplified maintenance and operation independent of related recorder. Control functions from 3 x 6" panel station and working adjustments from front of controller.

Recorders are designed for economy of panel space. Slide-out chassis with stretch-out cord permits withdrawal of recorder unit without interruption of service.

(Electronic Consotrol controllers are product of The Foxboro Co., Foxboro, Mass.)

Check 4253 opposite last page.



Rockwell Model ER Meter with automatic quantity control shut-off in food processing plant

Batch it, blend it, or just plain account for it!

IT'S GOOD BUSINESS TO METER ALL LIQUIDS

Wherever liquids are stored, mixed or used in plant operations, you can save time, money and improve efficiency with Rockwell industrial meters. With meters you can batch, blend and control formulas with precision. Handling volatile liquids, metering provides the safety of a closed piping system and guards against contamination.

Rockwell industrial meters are valuable accounting tools. Thousands use them for in-plant cost identification purposes, for inventory control—even to guard plant security.

You can measure most any piped liquid with Rockwell meters—oils, liquors, paints, chemical solutions—over 50 liquids in all. Use the coupon for full details.

CLIP COUPON—MAIL TODAY!



ROCKWELL MANUFACTURING CO.

Pittsburgh 8, Pa.

Gentlemen:

I am interested in measuring _____

(Name of Liquid)

Pipe Size _____

Working Pressure _____ psi

Temperature _____ °F max.

Max. Flow Rate _____ gpm

Min. Flow Rate _____ gpm

Your Name _____

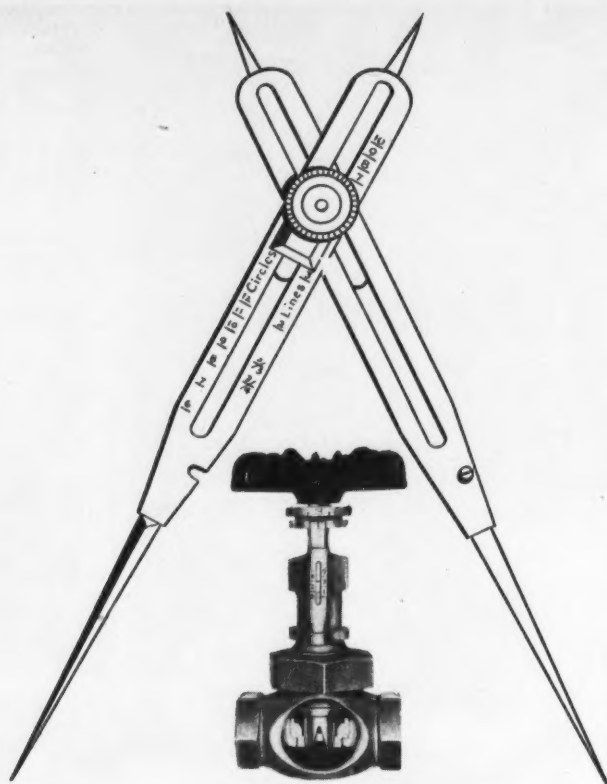
Company _____

Street _____

City _____

Zone _____

State _____



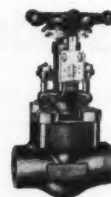
PROPORTIONER

controls flow to save for you

The V-port disc in all Hancock "Flocontrol" Valves insures proportional flow throughout the entire lift of the stem. They are valves that help you achieve uniform product quality through closer control, save steam and fuel on process work, and cut maintenance costs.

"3 in 1" valve design combines variable orifice with shut-off and micrometer dial and pointer. The valve opening can be set within 1/10 turn of the handwheel—you can duplicate all settings easily, instantly. No shut-off valve required—flow is in a straight line, with separate shut-off seating surface located away from the V-ports.

Hancock "Flocontrol" Valves are available in Bronze and Steel to meet the most demanding services. Ask your industrial supply distributor for details.



Hancock "Flocontrol" valves assure positive pinpoint control—eliminate all guesswork.



HANCOCK "FLOCONTROL" VALVES

A product of

MANNING, MAXWELL & MOORE, INC.

Consolidated Ashcroft Hancock Division • Watertown, Massachusetts

In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario

Check 4255 opposite last page

INSTRUMENTS & LAB

Indicates remote control of tank liquid level

Unit has matching network, checks several tanks

Uses: For providing instant, continuous visual check of tank fluid level on graduated meter scale.

Features: Remote indicator contains matching network, stepdown transformer, and sensitive meter calibrated in appropriate units. By using selector switch, liquid level in several tanks can be checked, in turn, with a single indicating unit. Operations for entire tank farm or process can be scheduled more accurately and efficiently. Fluid shipping operations, which carry heavy penalty for overflow, can be readily checked with this inexpensive instrument.

Description: Liquid-level indicator is attached to any tank by means of simple pipe plug. Basically, it is a pressure-operated resistance network that works in range of 0 to 3000 psi, which operates on less than 6 volts AC, eliminating necessity for code installation.

Pressure or liquid depth is measured by voltage across variable sector of network. Element can be supplied as an explosion-proof unit.

Accuracy of indicator is set at $\pm 5\%$. Ranges are available from 0-3 ft, 0-30 ft, and 0-60 ft of water, and up to 3000 psi pressure.

(Liquid-level indicator is product of the Torresdale Co., Dept. 116, 7844 Montgomery Ave., Elkins Park, Philadelphia 17, Pa.)

Check 4256 opposite last page.

Laboratory stop watches feature 2.36-inch dials, precision-type works

Electromagnetic model runs by hand or electrically

Uses: For timing laboratory experiments.

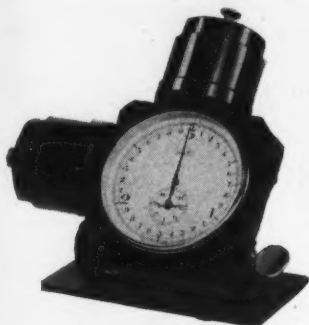
Features: Large-size laboratory stop watches incorporate, heavy-duty, precision movement built to withstand

INSTRUMENTS & LAB

rugged wear. Dial size of 2.36" permits maximum readability even from a distance.

Description: Three types are available. Electromagnetic has same movement as hand type and hand type with electrical contacts, but can be operated both by hand and electrically.

Electromagnetic model itself comes in several types: with starting and stopping ef-



Electromagnetic stop watch with stand

fected by electric impulses (with impulse magnets); or started by closing the circuit of the magnet and stopped when circuit is opened (continuous current magnetic type).

Watches will indicate 1/5 second, 1/10 second, 1/50 second, or 1/100 second as well as decimal types with a range of 1/100 of a minute.

(Jaquet laboratory stop watches are sold exclusively in the United States by Herman H. Sticht Company, 27 Park Pl., New York 7, N. Y.)

Check 4257 opposite last page.

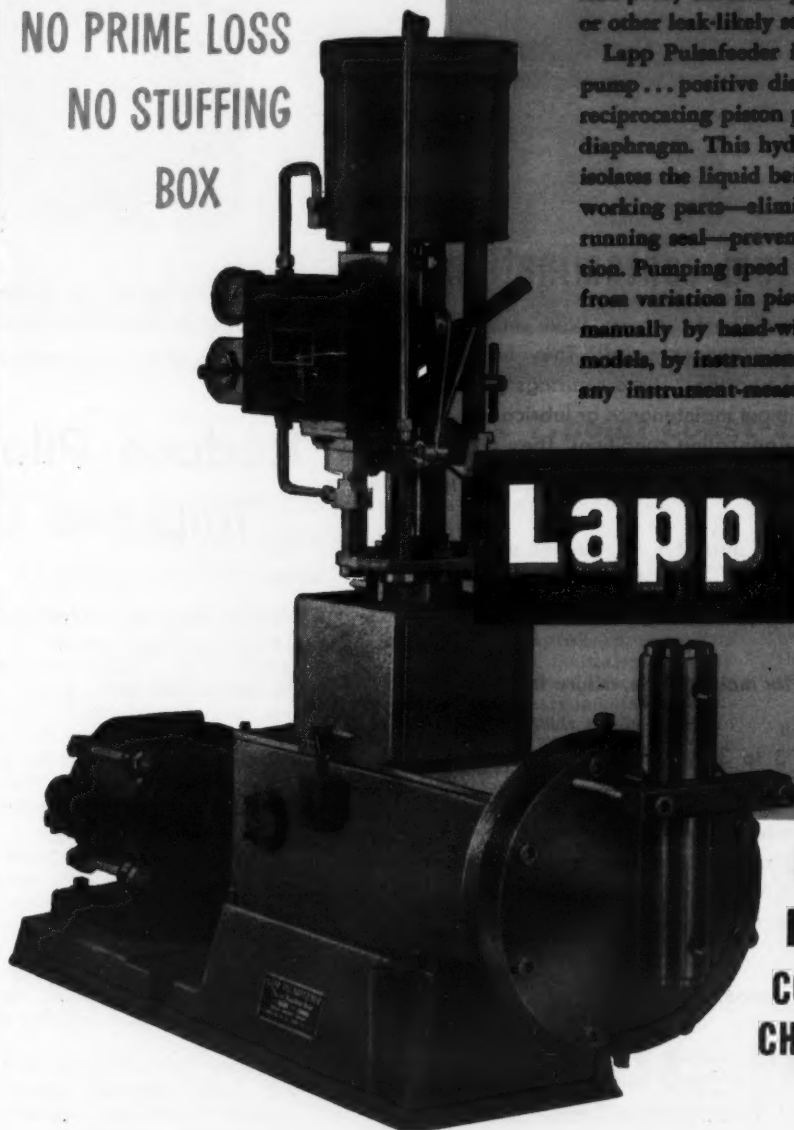
Flow meter with glass-tube indicating extension to permit use on pulsating liquids or gas applications is featured in four-page Spec Bul 10A1485—Fischer & Porter Co., 822 Jacksonville Rd., Hatboro, Pa.

Check 4258 opposite last page.

Tubeless telemetering system for long-distance data transmission is discussed in Spec S301-1—Industrial Division, Minneapolis-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44, Pa.

Check 4259 opposite last page.

NO LEAKAGE
NO CONTAMINATION
NO PRIME LOSS
NO STUFFING
BOX



Replace with PULSAFEEDER for Trouble-Free Liquid Metering

When the time comes to replace the chemical pump in your process, replace with a PULSAFEEDER—the leak-proof chemical pump that has no stuffing box or other leak-likely seal.

Lapp Pulsafeeder is a combination piston-diaphragm pump... positive displacement is achieved by a reciprocating piston pumping a hydraulic oil against a diaphragm. This hydraulically balanced diaphragm isolates the liquid being pumped from the pump's working parts—eliminates need of stuffing box or running seal—prevents product leakage and contamination. Pumping speed is constant, variable flow results from variation in piston-stroke length... controlled manually by hand-wheel, or, in Auto-Pneumatic models, by instrument air pressure responding to any instrument-measurable process variable.

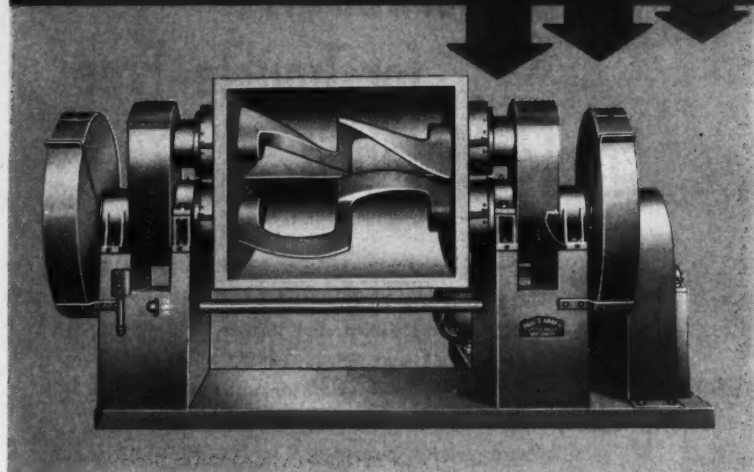
Lapp

WRITE FOR BULLETIN 440 with typical applications, flow charts, description and specification of models of various capacities and constructions. Inquiry Data Sheet included from which we can make specific engineering recommendation for your processing requirement. Write Lapp Insulator Co., Inc., Process Equipment Division, 3506 Poplar Street, La Roy, N. Y.

**Lapp
PULSAFEEDER
CONTROLLED-VOLUME
CHEMICAL PUMP**

Check 4260 opposite last page

new mass & paste mixers



**reduce maintenance,
assure freedom from contamination.**

These new heavy duty mass and paste mixers have many features which sharply reduce maintenance needs. They have double rows of lifetime lubricated bearings. These bearings give long, trouble-free performance without maintenance or lubrication of any kind under the most severe operating conditions. They are extremely low-friction bearings and can be used at elevated temperatures.

All gears are protected from dust and dirt by guards which remain in place whether the bowl is in the horizontal or the dumping position. Doors in the guards simplify lubrication of the gears.

Improved seals, easily accessible for maintenance, assure freedom from contamination.

Made in a range of sizes from 3 to 300 gallons capacity, the mixer illustrated has a mixing volume of 150 gallons.

These improved mixers are available in various materials of construction. Jackets for heating and cooling can be installed around the mixer bowl, if desired. Various styles of mixer blades can be furnished to ensure the most effective mixing and blending of a wide variety of materials.

Write today for additional information.

PAUL O. ABBÉ INC.

GRINDING & MIXING EQUIPMENT
402 CENTER AVENUE, LITTLE FALLS, NEW JERSEY

PEBBLE MILLS
STEEL BALL MILLS
JAR MILLS
JAR ROLLING MILLS
MASS & PASTE MIXERS
HOBSON MIXERS
ROTA-CONE BLENDERS
ROTA-CONE VACUUM DRYERS



IDEAS: from other industries and nuclear field
— new trends in research, processes, services



Fantastic speed in solving arithmetical problems with computer helps Standard Oil of California and its subsidiary, Oronite Chemical . . .

Reduce Pilot Plant Runs, Improve Design Data

Forty thousand arithmetical operations every second — equivalent to a year's work by 180 technicians every hour — are being performed with devastating regularity by a large-scale digital computer at Standard Oil Company of California's headquarters in San Francisco.

Solving problems of magnitudes which only a few years ago were regarded as unbelievable, the computer is the first such oil company installation. It was placed in operation in August 1957, and since has solved multitudes of problems.

Among them are those dealing with chemical process research and design, engineering research, petroleum process research and design, in-

strumentation and control, process planning, blending and process problems, stock balancing, and others.

The computer, one of the largest and fastest ever built for commercial use, will not be used as a clerical or accounting device. It uses the binary system instead of decimal number system, which means that all information is expressed in 1's and 0's rather than in the more familiar 0 through 9 number system.

Oronite Chemical Company, a SOCAL operating company, has used this fantastic electronic equipment with exceptionally good results, officials report.

Previously, California Research Corp., on behalf of Oronite, was required to un-

Check 4261 opposite last page



Electronic computer in service at Standard Oil Company of California in San Francisco, Calif.

undertake extensive and costly pilot plant operations to develop pilot plant programs for complex, large-scale operations. In some cases, programs extended over a period of years, involving hundreds of runs before satisfactory data were obtained. Cal Research is Standard's research arm.

Now, application of modern statistical methods plus use of the computer concurrently with a pilot program has resulted in: reduction in the number of pilot plant runs required to obtain a given accuracy and range of data; better evaluations of process safety factors and contingencies; better design data to give a closer approach to optimum plant designs. Freedom from error is one of the principal advantages.

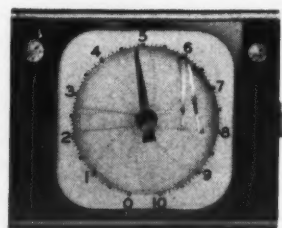
(IBM 704 is manufactured by International Business Machines Corp., 590 Madison Ave., New York 22, N.Y.)

Check 4262 opposite last page.



Bristol's 7-point coast-to-coast field service

Helps you from the time you start thinking instruments — through installation — for as long as the job requires



A Bristol Field Engineer is the man to call when you first start thinking about instrumentation. Located in a nearby Bristol office (they blanket the U.S. and Canada) he calls at your plant to assist you in planning your proposed installation. No obligation.

Application Engineers, specialists in the abilities and limitations of every type of instrument, and Process Specialists, experts in instrumentation techniques in varied fields can be called in where necessary. They insure you the right instrument, installation and operation for your specific job.

Service Engineers to keep your instruments operating perfectly are "on call" often within a few hours. They install, check and adjust instruments in your plant.

Periodic Check-up Service at regular intervals is also available.

Bristol's Instrumentation Schools for customer engineers help train your

own technicians in instrument operation and maintenance.

Factory Repair Service at San Francisco, Los Angeles, Chicago, Houston, Waterbury and Toronto has all facilities, parts, experience to properly repair, recondition and remodel Bristol instruments. Each instrument reconditioned carries a new instrument warranty.

Fast Parts Service is assured by the Bristol practice of stocking service parts that may be needed in emergencies in all 38 Branch offices. You get fast action from a near-by source.

These big extras you get with Bristol instruments are good reasons—over and above outstanding basic instrument quality—why every Bristol installation gives such high accuracy and precision performance over an extremely long service life. To find out more about Bristol instruments or service, write: The Bristol Company, 141 Bristol Road, Waterbury 20, Conn.

8.17

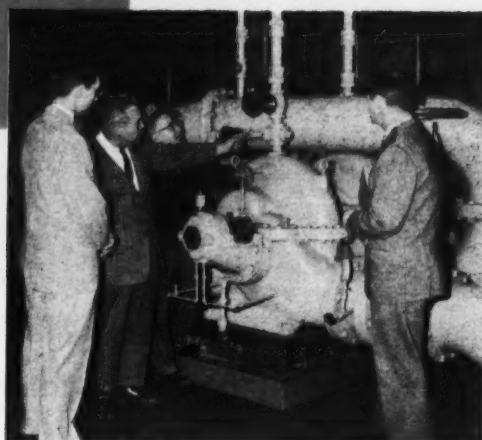
BRISTOL TRAIL-BLAZERS IN PROCESS AUTOMATION
AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

Check 4263 opposite last page

YOU GET BOTH FROM KUHNS



Kuhns D.I. fittings include pipe lock couplings (illustrated), flanges and screwed fittings, all pressure rated by Underwriters' Laboratories, Inc.



Kuhns technical team visits an installation prior to making recommendations.

DUCTILE IRON PIPE FITTINGS **PLUS** TECHNICAL KNOW-HOW

Kuhns supplies more than ductile iron pipe fittings for systems exposed to corrosive materials, high pressure, thermal shock, vibration and severe usage.

Our technical team... engineer, researcher and metallurgist... is ready to tackle your piping problem right in your own plant, at no obligation. Knowing how, when and where to use ductile iron fittings is our main business. Our experience could be profitable to you. May we be of service?

THE KUHNS BROTHERS CO.
1800 McCALL STREET • DAYTON, OHIO

Check 4264 opposite last page

IDEAS

Paper mill pioneers with cold caustic pulpig process

Produces corrugating medium from hardwood chips

Cold soda hardwood pulping process is being used to produce corrugating medium at The Stone Container Corporation's mill in Coshocton, Ohio. Reported to be the first mill in the country to use the process for this purpose, company has obtained pulping yields ranging between 80 and 82%.

Caustic consumption per ton of pulp is about 10%. Total power consumption in the pulp mill runs in the neighborhood of 18.9 hp days per ton of pulp.

Advantages claimed for the process include simplicity, economical operation, and excellent cleanliness in the finished stock.

In the process, hardwood chips are steeped in cold caustic liquor, without pressure, for period of two and a half hours. They are then washed, and refined in disk refiners. These units defiberate the stock and also subject the fibers to partial refining. From the refiners the pulp is gravity fed into stock chest.

Between 65 to 75 tons of corrugating medium are produced daily.

(Disk refiners used in process were made by Sprout, Waldron & Co., Inc., Muncy, Pennsylvania.)

Check 4265 opposite last page.

Low-cost slide rule made of durable plastic accurately performs arithmetic and trigonometric calculations. Measuring 12" long, rule has nine scales, comes complete with plastic pouch, and costs \$1.95. Model 120 "Trainer" slide rule — Pickett & Eckel, Inc., 542 S. Dearborn St., Chicago 5, Illinois.

NEXT MONTH

Take a tour through Formica Corporation's giant 40-million-sq-ft-per-yr flakeboard plant at Farmville, N. C. We'll serve as your guide in next month's Idea section.

**RAIN OR SNOW
CAN MAKE
CATWALKS
DANGEROUS**



Walkways, catwalks and treads made of solid wood, metal or other material can collect snow, rainfall, grease or oil and become dangerously slippery.

But these walking surfaces, made of an open mesh of metal bars on edge, cannot collect these substances, leaving the surface always clean, dry and tractional for safer access to high places.

As founders of the grating industry, the Irving Company can draw upon over half a century of experience to supply you with quality grating products for catwalks, treads and other practical and economical uses.

**"A FITTING GRATING
FOR EVERY PURPOSE"**

Write for our
General Grating Catalog.

IRVICO

IRVING SUBWAY GRATING CO., Inc.
Originators of the Grating Industry

Offices and Plants at
5050 27th St., LONG ISLAND CITY 1, N. Y.
1850 10th St., OAKLAND 23, CALIFORNIA

Check 4266 opposite last page

CHEMICAL PROCESSING

THAT'S
INTERESTING

Cool, cool water

According to the Plumbing-Heating-Cooling Information Bureau, per capita consumption of water in the U.S. is 145 gal a day. Lifetime water consumption, per person, is estimated at 26,000,000 gal. (Digest, Association of American Soap & Glycerine Producers, Inc.)

Make muscles for Atlas

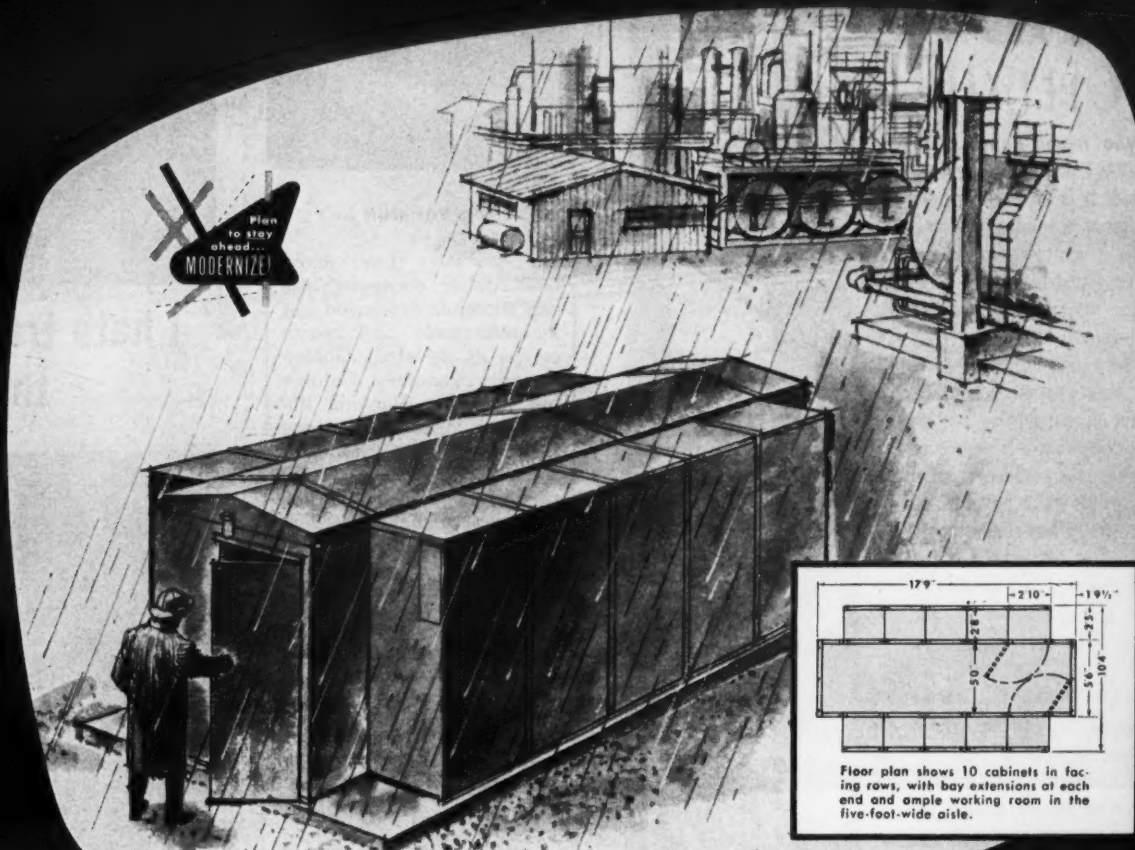
It takes a lot of energy to push the mighty Atlas intercontinental ballistic missile into outer space. Putting this energy into the missile in the form of a kerosene-type fuel and liquid oxygen requires the collective know-how of over 1200 companies which have supplied components for the big bird. (Your Consultant, Association of Consulting Chemists and Chemical Engineers, Inc.)

For more information on product at right, specify 4267 see information request blank opposite last page.



full SCOPE of
MOTOR CONTROL from...

ALLIS-CHALMERS



Let it rain, snow or blow...

New, Shelter-Clad walk-in enclosures provide complete protection for personnel and motor control

With the new Allis-Chalmers all-steel, walk-in enclosure, you can eliminate expensive, permanent buildings. Your field personnel can carry on inspection and maintenance work in complete safety and convenience, regardless of the weather. *Shelter-Clad* units can even be arranged to provide space for your field office work.

Simple, Flexible Packaged Units

Two facing rows of Allis-Chalmers Type H, 2000 to 5000-volt motor controllers are bridged by a sturdy metal roof with the backs of the control cabinets forming the outside walls. A five-foot-wide aisle, extending the length of the unit, is enclosed with doors at each end. A basic unit can consist of any number of facing cabinets — and any number of pairs of cabinets can easily be added or removed. These units meet NEMA 3 and 4 standards for weather resistance.

For details, contact the A-C office near you, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

Shelter-Clad is an Allis-Chalmers trademark.



A 5881

CROLL-REYNOLDS' NEW Convactor

If you never heard of a CONVECTOR, do not be surprised. It is an entirely new design of special condensing tower which offers important processing advantages.

In the refining of edible oils it recovers fatty acids, most of which were formerly waste. It offers another advantage of totally eliminating stream pollution from this source or the expense of cleaning cooling towers which collect such deposits. It has similar application in fatty acid stills, some other types of distillation processes, dryers, and other large vacuum processing units.

The CONVECTOR is a combination of two condensers and a vacuum cooling chamber. One condenser is of conventional barometric design, the other a highly improved condenser working on the jet principle. The latter condenses the vapor from the process and discharges directly into the vacuum cooling compartment for the immediate removal of condensation heat. The cold water is then recirculated through the same jet condenser. The flashed vapor from the cooling operation is condensed in a conventional barometric condenser using water from a river, cooling tower or other industrial source. Periodic blow-down or continuous bleed-off from the flash chamber permits recovery. Several large industrial installations have been made.



PATENT APPLIED FOR

Send for Folder

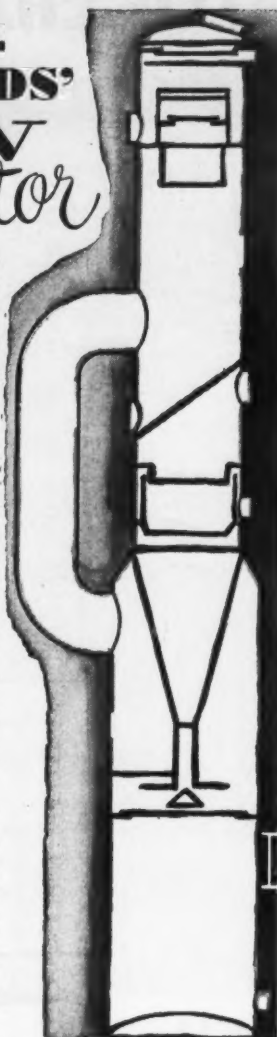
Croll-Reynolds CO., INC.

Main Office: 751 Central Avenue, Westfield, N. J.

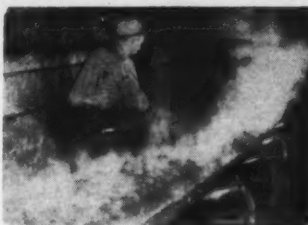
New York Office: 17 John Street, N. Y. 38, N. Y.

CHILL-FACTORS • STEAM-JET EVACTORS • AQUA-FACTORS •
FUME SCRUBBERS • SPECIAL JET APPARATUS

Check 4268 opposite last page



IDEAS



Handling hot stuff . . .

. . . for over three years, this rubber conveyor belt has successfully moved hot molding sand and waste scraps of metal at Golden Foundry Company, Columbus, Indiana. Showing little or no signs of wear, the 24"-wide, 5-ply belt moves the 180°F material 85' from casting floor to reclaiming point where shake-out sand is reclaimed and returned for re-use. It operates 12 hr a day, 5 days a week.

(Further information about rubber conveyor belts may be obtained from The B. F. Goodrich Company, Akron, Ohio.)

Check 4269 opp. last page.

Sea water distillation costs halved by unit

Distillation apparatus reported to be able to produce fresh water from sea water at nearly one-half cost of conventional units has been announced. Machine uses principles of thermocompression, operates continuously, at peak output and efficiency. Units are available in sizes ranging from 500 to 100,000 gpd.

(Sea water distillation equipment is product of the Mechanical Equipment Co., Inc., 861 Carondelet Cor. St. Joseph Sts., New Orleans 12, La.)

Check 4270 opposite last page.

Cold caustic pulping process for mixed hardwoods is described in 24-page report. Flow sheet and description of equipment are also included. Bul P-44—Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa.

Check 4271 opposite last page.



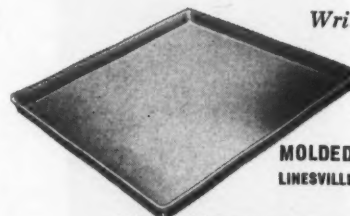
**I hate trays
that botch batches**



**But have you tried
molded fiber glass?**

No more leaks or spoiled batches. Toteline Molded Fiber Glass Trays don't corrode. They resist non-oxidizing acids, corrosive salts, weak alkalies, many other chemicals. They're great!

- Anti-corrosive • Won't bend, dent or splinter
- Lightweight • Clean easy • Wire-reinforced edges



Write for complete
information and
name of nearest
representative

MOLDED FIBER GLASS TRAY CO.
LINESVILLE, PA.

TOTELINE

MF-59-03

Check 4272 opposite last page

CHEMICAL PROCESSING

Response from 33 leading chemical firms in recent survey has disclosed some significant facts about heat exchangers and their use in the chemical processing field. In answer to question about wear, most companies agreed that . . .

Tube fouling heads list as major cause of heat exchanger breakdown

Recent survey conducted by the research department of Putman Publishing Company has revealed some interesting information about heat exchangers in the chemical processing field. Conducted in late 1958, the study drew response from 33 major chemical companies in the U.S., representing a total of 272 chemical processing plants.

Number of heat exchangers reported on in the survey was 38,296. This amounted to a total heat transfer surface of 13,381,000 sq ft.

The study revealed that by far the most common heat exchanger in use at these plants is the fixed tube-sheet type. It accounted for about 56 percent of the units. Carbon steel was listed as the most popular material of construction, comprising 39 percent of total reported surface area. Copper alloy ranked second with 23 percent, and stainless steel alloys third with 17 percent.

Major Causes of Breakdown

Of the 33 companies reporting, 18 said that tube fouling was the major cause of heat exchanger breakdown. Fourteen stated that corrosion was the most common cause. Erosion topped the list of one company, but was mentioned as a factor by 17 others.

Sixteen firms said that they preferred double groove in the tube sheet as the best type of tube-to-tube connection. Ten selected welded construction as their best choice.

In the tube itself, 55 percent

of the companies preferred seamless over welded, 18 percent preferred welded, the remainder reporting no preference or "depends on service". In general, a preference for seamless tube correlated with the use of carbon steel construction, and for welded tube with the use of stainless steel construction.

In 47 percent of the companies, main product stream was reported to be on tube side of the exchanger. Shell-side flow was preferred in 28 percent of the cases. Remainder indicated no preference or "depends on service".

Of the 33 firms covered, 21 estimated dollar amount and surface area of heat exchangers purchased in 1957. Representing 208 plants, these 21 firms reported a total of \$9,206,000 spent, or an average purchase of \$44,200 per plant. Total surface area amounted to 1,159,800 sq ft, or an average of 8350 sq ft per plant.

Almost 56 percent of the respondents stated that their total annual purchases of heat exchangers during 1957 was above average. Sixty percent of the companies reported that their purchases dropped below average during 1958.

Selection Factors

In 17 out of 32 companies answering the survey, heat exchangers were selected on basis of performance specifications. Seven said that selection was based on design details. Eight firms listed both systems or "depending upon

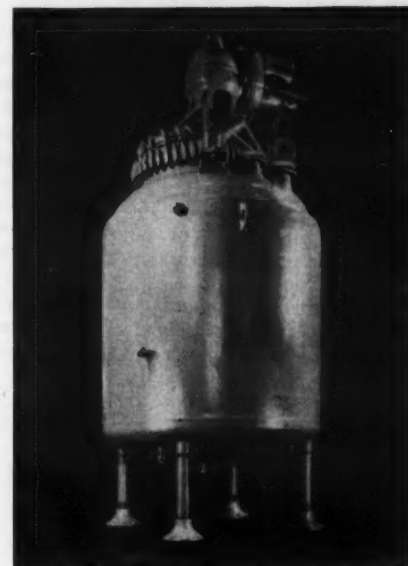
To page 128

FLUIDICS

is a Pfaudler Permutit program providing
the know-how
the equipment
and the experience
for solving problems involving fluids.

FLUIDICS covers:

corrosioneering
water treatment
reactions
waste treatment
fluid analysis
agitation
distillation
blending
metering
piping
storing
heat transfer
centrifuging



FLUIDICS AT WORK

30% More Thermal Shock Protection With R Series Reactors

Thanks to Glasteel 59, today's R series reactors give you 30% more thermal shock protection, 20% greater abrasion resistance and still longer service life than what you bought less than a year ago.

In addition you get . . .

Flexibility. Whether your processing requirements involve highly corrosive acids, sticky materials, protection against product contamination or ease of cleaning, you find a good practical answer with the R series.

Low Maintenance Flush Valve. One-piece "glassed" head and stem resting on a glass-filled Teflon seat

give positive seating and minimize product build-up. The improved maintenance record on this valve over previous design will pleasantly surprise you.

New Drives. For up to 7.5 H.P. it's the "W" type worm gear drive. For higher power to 60 H.P. plus it's the "BH" bevel gear drive. Both are quiet running, easily maintained and competitively priced. Former drives also available.

10-Day Delivery. Standard sizes range from 200 to 4,000 gallons. The 500, 750, 1,000 and 2,000 sizes are prestocked for 10 day delivery.

Specifications. Write our Pfaudler Division, Dept. CP-39, Rochester 3, New York for Bulletins No. 960, 965 and 972.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS . . .
the science of fluid processes



Check 4273 opposite last page

Future looks bright for polypropylene in textiles

Fibers lend themselves to regular spinning operations

Polypropylene fiber may find its place in the textile industry. Although commercial production of polypropylene yarn is limited at present to comparatively heavy monofilaments and multifilaments as necessary for industrial purposes; as far as low denier yarns are concerned, pilot plant tests have proven that the material can be used successfully in woven and knitted apparel. This includes 100 percent polypropylene, or in blends with other fibers such as wool, rayon, or cotton.

Polypropylene filaments in the gage of approximately 15 deniers are already pilot plant products at Montecatini, Italy, and Hoechst Farbwerke in Germany.

Less Slippery

The fibers seem to lend themselves much better to regular textile spinning operations than any of the known polyethylene fibers. This is due to their superior resilience and the fact that their surface is less waxy or greasy, therefore less slippery than for polyethylene.

Recent price changes place polypropylene at only a slight economic disadvantage. Basically, the fiber should even be somewhat less expensive than polyethylene, because its lower density gives about six percent higher yield in yards per pound than linear polyethylene. Therefore, polypropylene fiber may be in a stronger position than polyethylene to compete with saran, and in some instances with nylon.

Melting Point is 310°F

One of the advantages of polypropylene is its high melting point — 310°F compared to 270°F for the high density polyethylenes. Polypropylene at room temperature has a strength of 5½ to 7 gr/den, which is comparable to that

specialized Can business publications

By reputation, salesmen are reluctant to credit anything but their own selling efforts for getting names on the dotted line.

Actually, it's quite a different story. The most successful salesmen will tell you two important things about selling. 1. That the selling process is largely a matter of communicating ideas. 2. And that specialized business publication advertising can help importantly to register information with prospects.

Of course each salesman will express this in his own way...but they all agree that selling would be far more difficult without the advertising that appears in the industrial, trade, and professional publications that serve the specialized markets to which they sell.

Here, for instance, is what three salesmen say about this kind of advertising:

lot of that has come from our advertising campaigns. Our name is known throughout the world right now, purely because of our advertising program. When I go to a prospect now, they know my company, they know my product... it makes my job easier, and opens doors when I have to make cold calls."



George A. Ecclesine
Gerberich-Payne Shoe Co. sells to retailers

Says Mr. Ecclesine:

"We couldn't get along without trade advertising in the boy's shoe business. I'll tell you why.

"Ours is not a big shoe company but we have to cover the whole country. There are just ten salesmen. Most of our business is done with the smaller retailers and you can see that we are not able to call on any one retailer too often. But our advertising can call on these fellows every month. We know that they see the ads and read them because they know who we are when we walk in the door and they're ready to start talking about the very things that have appeared in our ads.

"For instance, we had an idea that the boy's shoe business was being neglected by the general clothing store or the general shoe store, and was drifting to the men's shoe stores. To dramatize this concept of business being lost we started running a series of initials at the foot of our ads. They read BSB-FMB.

"People in the trade started asking about these initials and the mystery was built up to a climax at the shoe convention in Chicago that year. There we made it known that the initials stood for 'Boys Shoe Business is Future Men's Business.' The idea really caught on. As you can see, the whole build-up was made, quite inconspicuously.



William W. Cox
AMP, Incorporated sells to industry

Says Mr. Cox:

"The quickest way we can introduce a product is by introducing it through advertising in business papers. That way we get it around faster than we can by word of mouth alone. On occasion my home office has inquiries out to me before I can get to the customer or prospect to introduce a new product. They've already seen it in a trade magazine.

"It's interesting to note that within the last two weeks I received a survey which shows about 80% of the new customers we get on our books comes through our trade publication advertising. Of course, our company is only 15 years old and we have grown from what you might say, nothing, to the biggest in our business. Certainly a

Advertising actually sell?

ously too, in our trade advertising. That's just one example of how much we know these trade ads are read, and what a job they are doing for us."



Fred Snyder, Cleveland District
Worthington Corporation

sells to industry

Says Mr. Snyder:

"We have, of course, sales leads from our business paper advertising that are forwarded to us on a monthly basis. But also the trade advertising has its impact on many who do not at the time request specific information. Worthington is far better known today than it was five years ago, due in no small measure to the aggressiveness of its advertising and sales promotion department.

"Their work makes my job easier. First of all, we have an entree in companies where some Worthington products were not previously as well-known as our original line. We're getting a lot better sales coverage on all products. The Corporation manufactures so many products today that even regular customers may be unfamiliar with some of these products. Through trade advertising and sales promotion we have been able to sell the whole Worthington line.

"Getting back to sales leads—they are particularly helpful to our dealers. In Cleveland, W. M. Patterson Supply will undoubtedly receive inquiries from Worthington's advertising. Scott-Tarbell, Inc., Cleveland Oak Belting, or other dealers handling special product lines will pick up leads from our advertising to help them get business.

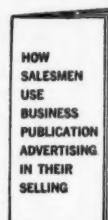
"I think we've grown eightfold since the war. This year we hit two hundred million. It used to be that twenty-five million was a good year. The advertising and sales promotion department

has aggressively been attacking their part of the problem within the last five years. Prior to that the name Worthington was not nearly so well known and we put much less emphasis on advertising."

Ask your own salesmen what your company's business publication advertising does for them. If their answers are generally favorable you can be sure that your business publication advertising is really helping them sell. If too many answers are negative it could well pay you to review your advertising objectives—and to make sure the publications that carry your advertising are read by the men who must be sold.

How salesmen use their companies' advertising to get more business

Here's a useful and effective package of ideas for the sales manager, advertising manager or agency man who would like to get more horsepower out of his advertising. Send for a free copy of the pocket size booklet entitled, "How Salesmen Use Advertising in Their Selling," which reports the successful methods employed by eleven salesmen who tell how they get more value out of their companies' advertising.



You'll find represented many interesting variations in how they do this. Some are very ingenious; all are effective. You can be sure that more of your salesmen will use your advertising after they read how others get business through these simple methods.

The coupon is for your convenience in sending for your free copy. Then, if you decide you want to provide your salesmen with additional copies, they are available from NBP Headquarters in Washington, at twenty-five cents each. Or if you choose you can reprint the material yourself and

distribute it as widely as you please. But first, send for your free copy.

NATIONAL BUSINESS PUBLICATIONS, INC.



...each of which serves a specialized market in a specific industry, trade or profession.

NATIONAL BUSINESS PUBLICATIONS, INC.

Department 1A
1913 Eye St., N.W.
Washington 6, D. C.

STerling 3-7533

Please send me a free copy of the NBP booklet
"How Salesmen Use Advertising in Their Selling."

Name _____

Title _____

Company _____

Street Address _____

City _____

Zone _____

State _____

of linear polyethylene: At 248° F its strength is about 2½ gr/den against approximately 1 gr/den for high density polyethylene. Its strength is 2 gr/den at 266°F, when polyethylene is already out of commission (nylon, on the other hand, still has double the strength of polypropylene at this point).

With regard to other fiber properties, polypropylene has higher flexural strength and stiffness than linear polyethylene. However, it remains considerably below that of nylon or unplasticized saran. Abrasion resistance of linear polyethylene compares favorably with that of nylon, but polypropylene appears to be somewhat below that level.

Possible disadvantage of polypropylene could be its brittleness at low temperatures. The brittleness-temperature is higher than that of the polyethylenes, which are outstanding in this respect.

Ultra-violet stability is also not the best. Tests have shown that for clear unstabilized polypropylene filaments the stability is about the same as for the old branched-type polyethylene. Work is now being done to improve this.

(Condensed from paper "Polyolefin Fibers in Textiles", prepared by Victor L. Erlich, Director of Research, Reeves Brothers, Inc., 1071 Avenue of the Americas, New York 18, New York. Copies of original paper are available.)

Check 4274 opposite last page.

Nuclear graphite is discussed in 8-page, illustrated bulletin. Tabular data on properties and comparative data on graphite versus other materials used for moderators and reflectors are included. Cat Sec. S-4905—National Carbon Co., 535 Fifth Ave. New York 17, N.Y.

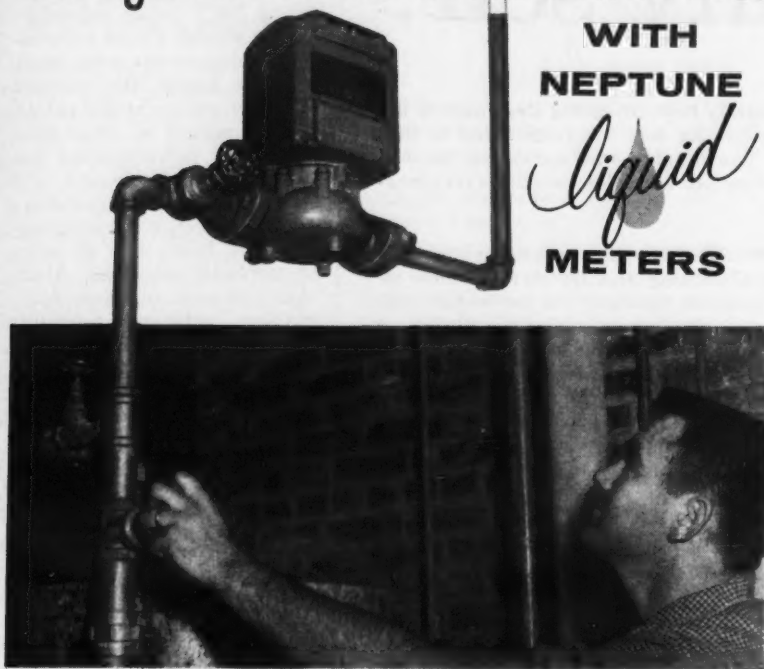
Check 4275 opposite last page.

Russian translations of scientific journals available to science and industry are listed and abstracted in semi-monthly directory. "Technical Translations" may be obtained by remitting \$12.00 a year (\$4.00 additional for foreign mailing) or 60 cents per copy direct to Office of Technical Services, U. S. Dept. of Commerce, Washington 25, District of Columbia.

HOW C. F. DOWNEY BOX GETS Stronger Adhesives...Less Starch Loss

WITH
NEPTUNE

Liquid
METERS



For uniform strength in shipping containers, C. F. Downey Box Division keeps a watchful eye on the adhesives used. They formerly measured the water into the starch-base mix by filling a large, square tank up to a mark. It was tough to hit the mark on the nose every time. Too *much* water would make the adhesive too thin, and it was difficult to add starch to the finished cook. Too *little* water and the adhesive had to be dumped quickly before it clogged the tank and lines. It cost \$100 every time an error wasted a batch.

Now an accurate Neptune meter does the measuring...with assured results and no losses or rejects. The meter pays for itself over and over again in starch savings alone.

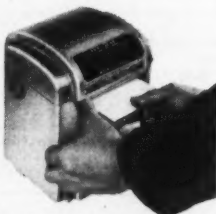
Similar savings in time and ingredients can be made in *your* plant, by adding Neptune meters wherever liquids are batched, blended or transferred. Tell us what you want meters to do for you and we'll gladly tell you the best, most economical way. Write today for Bulletin 566 BP

See Neptune data pages in
Chemical Engineering Catalog.

NEPTUNE METER COMPANY
19 West 50th Street • New York 20, N.Y.

neptune

Branches in: ATLANTA BOSTON • CHICAGO
DALLAS • DENVER LOS ANGELES • LOUISVILLE
NO. KANSAS CITY, MO. PHILADELPHIA • PORTLAND, ORE.
SAN FRANCISCO (Millbrae) In Canada: TORONTO 14, ONT.



METER-PRINTED TICKETS
give dispute-free record of every batch...perfect for quality control, cost accounting, inventory. Other Neptune features: Auto-Stop quantity control; Auto-Switch electrical control for pumps; Stainless Steel construction.

Check 4276 opposite last page

IDEAS

Heat Exchanger Survey

From page 125

circumstances" as their basis of selection.

Central engineering departments prepared or assisted in the preparation of specifications for most new-plant purchases — or in 73 percent of the cases. This dropped to 27 percent on replacements or changes to existing heat exchangers. Plant engineering departments were involved in new-plant purchases 42 percent of the time. However, they were in the picture almost 97 percent of the time in replacement cases.

About 66 percent of the respondents said they placed their own orders for heat exchangers on major construction projects rather than have their contractor do this. When placing orders, design of heat exchanger was listed as the most important factor by 78 percent of the firms. Delivery, maintenance, and manufacturer's engineering service were listed as next most important.

When questioned where replacement tubing was usually bought, almost 70 percent of the companies said they obtained this from tubing distributors. The tubing manufacturer was mentioned as the next most popular source. Heat exchanger manufacturers were listed last.

(Based on "Survey of Heat Exchanger Use and Buying Practices", conducted by Putman Publishing Company, 111 E. Delaware Place, Chicago 11, Illinois.)

Sodium-tracer sleuthing shows evaporators yield very pure water

Flame-photometer tests, recently developed, were used in a six-month evaluation of the purity of industrial evaporator vapor. Testing at Possum Station 3 of Virginia Electric and Power Company showed that evaporator vapor can be produced with less than 10 lb of impurity per 1 billion lb of water.

Testing strongly indicates

that vapor of high degree of purity may be obtained without use of moisture separator.

Purity of water is important in high-velocity steam in order to prevent damage to supersonic turbine motors. Contamination is critical in nuclear power industry as well as in all industries using steam or water for heating and cooling.

In apparatus used in tests, intense heat from hydrogen-oxygen flame evaporates all moisture from a sample of water or steam. Flame causes sodium salts previously dissolved in water to glow bright yellow.

Intensity of glow, which varies with amount of sodium present, is measure of dissolved solids in sample. Strip-chart recorder keeps permanent record.

(Further information on flame-photometer testing of evaporator purity may be obtained from Griscom-Russell Company, subsidiary of General Precision Equipment Corporation, Massillon, Ohio.)

Check 4277 opposite last page.

Battery leasing program stretches truck dollars

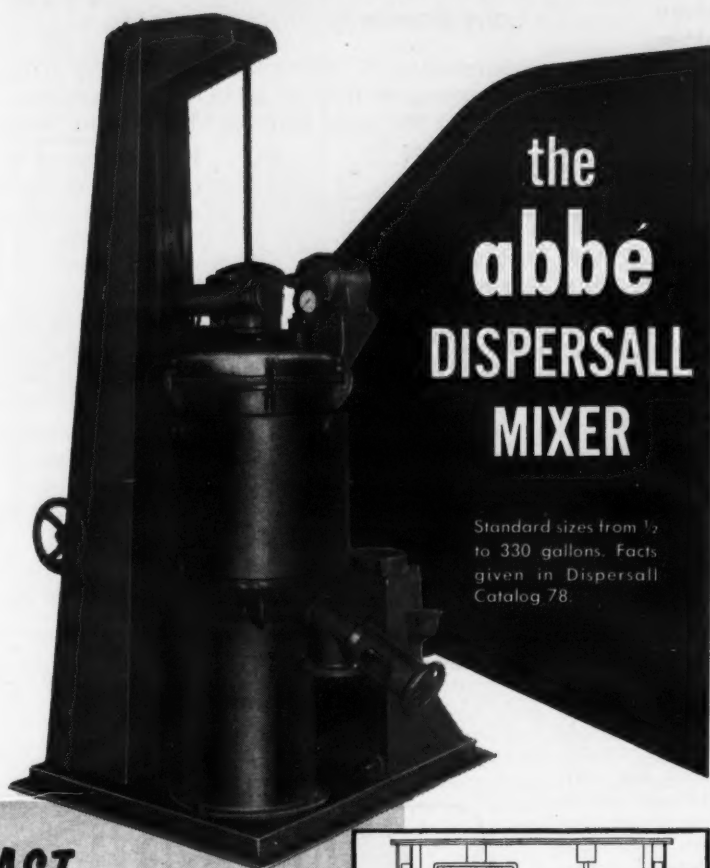
Helps Lambert-Hudnut to buy
extra rolling stock

Leasing of storage batteries and charging equipment for electric industrial trucks effected enough savings at Lambert-Hudnut Manufacturing Laboratories to enable company to stretch equipment budget and initially buy one more vehicle than had been planned originally.

During the two years since the original leasing, this subsidiary of Warner-Lambert Pharmaceutical Company has added three more trucks and leased batteries for them. This indicates continuing approval of the lease principle.

When new plant was opened in Lititz, Pa., funds were allotted to procure five trucks. Because of a rapidly expanding volume, it soon became apparent that at least six trucks were needed to move

LIQUIDS, SLURRIES, PASTES

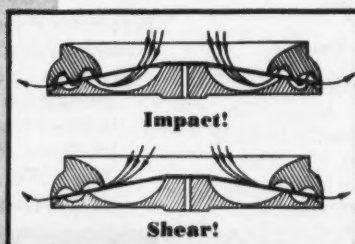
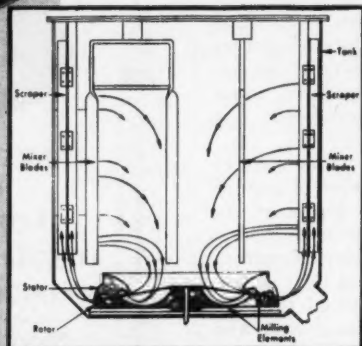


the abbe DISPERSALL MIXER

Standard sizes from 1/2 to 330 gallons. Facts given in Dispersall Catalog 78.

**FAST,
THOROUGH,
COMPLETE
ACTION!**

**... BLENDS
DISPERSES
EMULSIFIES
DISSOLVES
MIXES**



abbe' ENGINEERING COMPANY
620-E Graybar Bldg., New York 17, N. Y.

Designers and Manufacturers of

Ball, Pebble and Jar Mills • Pulverizers • Sifters • Cutters • Mixers

Check 4278 opposite last page

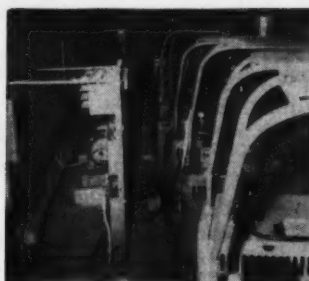
IDEAS

antiseptics, beauty preparations, and toilet goods.

60-month Lease

Exide-Ironclad batteries were leased on 60-month basis with uniform monthly payments. There is a separate lease for each purchase unit. Company has option to purchase batteries and charging equipment at end of lease period. Batteries and charging equipment are expected to last much longer than lease period.

Batteries are charged once daily in the trucks by one man at a central charging station on first floor. Trucks normally



Trucks assembled at central charging station for once-daily battery charging

work one eight-hour shift a day, but occasionally there is overtime work. When this happens, any truck can be used, as all batteries have sufficient reserve capacity for overtime usage. Trucks are rotated if several successive days of overtime are involved.

Minimum Downtime

Company reports that battery-powered equipment keeps downtime at a minimum.

Larger trucks have battery-powered, two-way short-wave radios which give added control over palleting program and unique electronically controlled order-picking system, by cutting down on unnecessary or empty trips.

(Leased batteries and chargers are available from Exide Industrial Division, The Electric Storage Battery Co., Rising Sun and Adams Aves., Philadelphia 20, Pa.)

Check 4279 opposite last page.

FLEXIBLE TUBING

Made from

TEFLON*

For

Chemical Feed Lines (laboratory, catalyst, pilot plant reusable), Hot Corrosive Liquids or Steam Lines, Hydraulic Hose, Braiding and Fittings for Pressure Use

And Similar Applications Where Only PF TEFLON* Can Do The Job

PROPERTIES

- complete chemical inertness
- lowest coefficient of friction of any solid material
- very low permeability
- widest service temperature of any plastic (-450°F to +500°F)
- easily cleaned and sterilized without deterioration

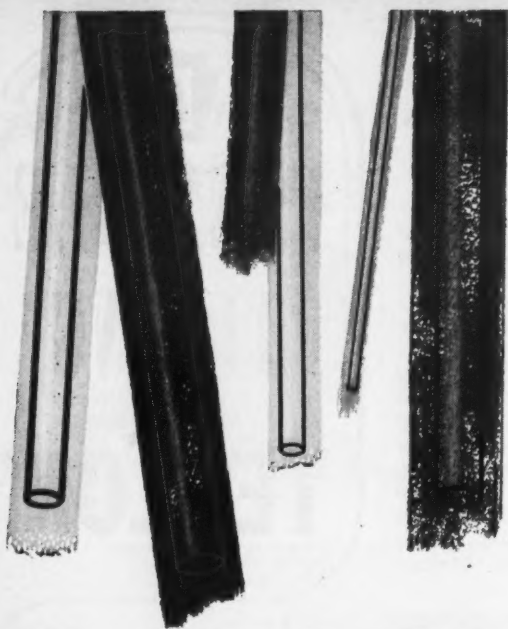
Pa. F. flexible tubing is available in a full range of colors and sizes. Our extrusion techniques yield maximum service flexibility and all sizes are carefully inspected and controlled dimensionally.

Write, wire or 'phone for additional details, competent engineering assistance and prompt attention to special sizes and walls. Pressure testing and certification upon request.

**PENNSYLVANIA
FLUOROCARBON CO., INC.**
1115 N. 38th St., Phila. 4, Pa., EV 4-0603

*Teflon—DuPont trade name for Tetrafluoroethylene resin
TWX PH 252

Check 4280 opposite last page



SMALL DIAMETER TUBING

seamless...as-welded...welded-and-drawn
Stainless...Monel...Inconel

Fast delivery on most-frequently-ordered sizes and alloys await your call. Modern production equipment and specialization in small diameter tubing assure quick delivery on "special" orders.

Diameters from $\frac{1}{8}$ " to 1". Tempers and finishes available to meet every specification.

All Greenville tubing undergoes a series of production line tests to insure uniformly close tolerances. Random samples receive crush and flare tests. All drawn tubing is 100% eddy current tested. Air-pressure, hydrostatic-pressure or other tests are made in accordance with purchaser's end-use and specifications.

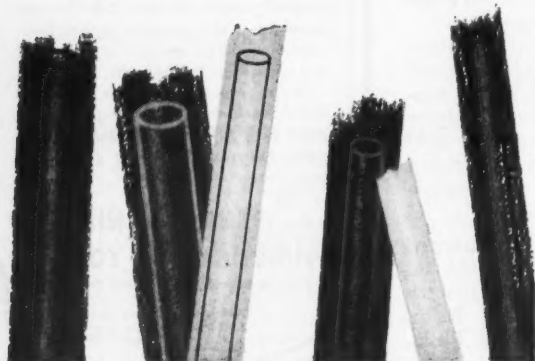
Let us quote on your next order...large or small.

4898



GREENVILLE TUBES, INC.

Greenville, Pennsylvania
Subsidiary of Edwin L. Wiegand Company
Pittsburgh 8, Pennsylvania
Phone Transfer, Pa.—Mitchell 6-3200
Greenville, Pa.—1874



Check 4281 opposite last page

IDEAS

**No extra hardware
needed in bleaching
cold caustic pulp**

Cold caustic pulp can now be bleached without additional equipment. Bleaching with peroxide bleach liquor occurs during refining operation. Brightness increases of up to 20 points have been obtained. Technique incurs no extra steam costs. No holding time is required. Process permits use of greater amounts of low-cost pulp.

(Further information about cold caustic pulp bleaching process may be obtained from Becco Chemical Division, Food Machinery and Chemical Corp., Station B, Buffalo, N.Y.)

Check 4282 opposite last page.

**Television X-ray system
permits economic, 100%
production inspection**

Automated quality control has taken another big step forward with introduction of a television X-ray image system which permits economical 100 percent product inspection on a television-type screen 10,000 times brighter than conventional fluoroscopic images.

One of major advantages of system is brightness of picture which enables inspector to view easily in normally lighted areas product being examined. With conventional fluoroscope, inspector is required to work in darkened room or area and can stay on job only for relatively short periods.

Image Size Variable

System provides product inspector with image size electronically variable from $\frac{1}{2}$ to 3 times that of original object. Sensitivity is not greatly affected by enlargement.

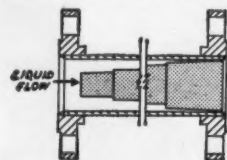
Comparable to standard closed-circuit TV hookups, system permits use of extra monitor or any ordinary TV receiver if simultaneous observation from separate locations is desired.

Product inspection viewing can be done at distances up to

NEW PIPING STRAINERS

*Simplify removal of objectionable
dirt from any piping system*

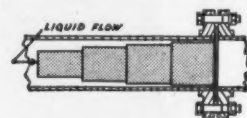
Elimination of objectionable dirt particles and other foreign matter from air, gas or liquid streams is accomplished effectively with Air-Maze Piping Strainers.



Installation of Air-Maze Piping Strainer in pipe strainer body.

For economy of installation, these strainers are mounted directly into any line using conventional Schedule 40 S pipe and Series 15 flanges. Cylindrical in design, the metal media

has multiple steps to provide maximum filtration area. Media in opening sizes .0013" to .0307" can be supplied. Maximum operating temperature 250°F. Maximum pressure drop 50 psi.



Installation of Air-Maze Piping Strainer in flange pipe.

Furnished with pipe strainer bodies, where required for nominal pipe sizes from 2" to 24".

Write Air-Maze Corporation, Department CP-3, Cleveland 28, Ohio.

Check 4283 opposite last page



TANK-METER

FOR MEASURING TANK CONTENTS
ANY DISTANCE AWAY

TANKS MAY BE...

- BURIED OR ELEVATED
- OPEN • CLOSED • VENTED
- UNDER PRESSURE • UNDER VACUUM
- UNDER PRESSURE AND VACUUM

ACCURATE • RELIABLE • DURABLE

Also gauges for:

- Barometric Pressure (Mercury Column)
- Absolute Pressure (Mercury Column)
- Pressure and Vacuum
- Differential Pressure
- Inclined Manometers for draft, pressure or differential pressure.

SEND FOR BULLETINS



Uehling
INSTRUMENT CO.

488 GETTY AVE.
PATERSON, N. J.

SINCE 1896

Check 4284 opposite last page

CHEMICAL PROCESSING

by E.D. FILPAPER

THERE'S A BOTTLENECK IN OUR VARNISH FILTERING... TOO MUCH TIME LOST SCAVENGING AND...

LET'S CALL THE E-D FILTER EXPERTS!

PUT IN A FILTER THAT USES ONLY PAPER!

THAT WOULD BE EATON-DIKEMAN FILTER PAPERS, OF COURSE.

LOOKS LIKE E-D FILTER PAPERS HELPED TURN THE TRICK.

THEY'RE SAVING US DAYS AND DOLLARS, TOO. OUR THROUGHPUT IS NOW FAR GREATER THAN WITH THE OTHER MEDIA.

BASED ON EXPERIENCE, DETAILS ON REQUEST.

YOU CAN'T BEAT E-D FILTER PAPERS FOR QUALITY AND RELIABILITY. MADE FOR EVERY REQUIREMENT. CUT AND PUNCHED TO FIT YOUR FILTERS. WRITE FOR FREE SAMPLES.

Write for FREE Sample Filter Papers to THE EATON-DIKEMAN CO. Filtertown, Mt. Holly Springs, Pa.

1400 feet between monitor and camera, with monitor and inspector remote from x-radiation. System permits safe use of any X-ray intensity necessary for adequate penetration up to limit of associated X-ray generator.

X-ray sensitive camera, control unit, and viewing monitor comprise basic units of



X-ray image photographed off 12-inch TV X-ray monitor screen is actually a 2 x 2" area of a "potted" (foam plastic encased) electronic component. Image has been magnified both geometrically and electronically

system. All are enclosed in metal cabinets equipped with ventilating screens. No special generating apparatus is required.

There are three major components to the camera—X-ray image pickup tube, horizontal and vertical sweep subchassis, and preamplifier chassis.

Five subchassis are in the control unit—rectifier, regulator, video, sync, and blanking. Components are protected from over-heating by blower which circulates air.

Viewing monitor has 12-inch picture tube and chassis with circuitry to translate electrical image into visual image and to provide high voltage for picture tube.

Camera is 11½" wide, 17½" deep, 11¼" high; control is 15" wide, 22" deep, 8½" high; monitor, 15" wide, 22" deep, 16½" high. Camera weighs 20 lb, control 66 lb, monitor 88 lb.

(G-E TVX X-Ray Image Intensification System is product of X-Ray Dept., General Electric Company, 4855 West Electric Ave., Milwaukee 1, Wis.)

Check 4286 opposite last page.

"I've chipped off all the rust, Chief, but don't the walls seem kind of thin?"



If corrosion and contamination are eating into your profit margin, you need chemical-resistant equipment by American Hard Rubber Company. Look today to see where you can use Ace rubber and plastic pipe, valves, pumps, tanks and special parts. It doesn't cost... it pays!

Ace chemical-resistant rubber-lined steel pipe best for high-pressure, big sizes, or abrasives. Pipe, fittings and valves 1½ to 24".

STRENGTH OF STEEL



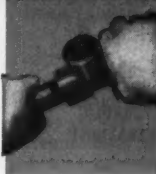
Highly efficient WE pump. Capacity to 360 gpm. Cast iron, fully protected by top quality, chemical resistant hard rubber lining.

BIG GIANT OF ACE PUMPS



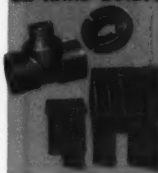
Variety and quality to match any plastic piping. Rivclor PVC, Ace-Ite rubber-plastic, Parian poly, Ace Saran, Tempron high temperature nitrile, hard rubber-lined steel.

Supermarket for PLASTIC FITTINGS



Design assistance and facilities for molding special fittings, pump parts, etc., of plastics or hard rubber. Also large hand-fabricating facilities.

CUSTOM MOLDED OR HAND BUILT



ACE processing equipment of rubber and plastics

AMERICAN HARD RUBBER COMPANY
DIVISION OF AMERACE CORPORATION
Ace Road • Butler, New Jersey

See our pages in cee Catalog!

Check 4285 opposite last page

Check 4287 opposite last page



ELIMINATE SHAFT SEAL PROBLEMS WITH VANTON PLASTIC SEALLESS PUMP!

New low-maintenance design by-passes leakage, scoring, corrosion, features:

- No stuffing boxes
- No shaft seals
- No valves or gaskets
- No metal parts in contact with fluid
- Non-agitating
- Self-Priming; high-vacuum
- Flexible liner absorbs abrasive action of suspended solids
- Non-contaminating

Now at last comes a pump designed to give you complete protection against leakage, corrosion, contamination, abrasion, maintenance problems.

Operating on a radically new design principle, which eliminates stuffing boxes and shaft seals, the Vanton pump is a low-cost, versatile, simple yet carefully engineered unit, problem-free with minimum maintenance. Construction materials include PVC, high-temperature polyethylene, Teflon (DuPont), Buna N, bakelite, or stainless steel, in capacities from 1/2 to 40 GPM.

Write for your free 8-page Vanton Catalog! It gives the whole Vanton story!

Also available: Flex-Plug Plastic Gate Valve. Combines gate valve's full flow with globe valve's throttle control. Write for Flex-Plug valve folder.



VANTON PUMP
and Equipment Corporation, A Division of
COOPER ALLOY
Corporation • Hillside, New Jersey



What's Your Fluid Handling Problem? Vanton's Technical Service Can Help You Solve It!

Mr. Carl Tylka, Director Cooper Alloy Technical Service Dept.



Whatever your pumping, valving, or piping problem—equipment specification, construction material, circuit design and layout—Vanton's fully competent, experienced Technical Service staff can be of help to you.

Headed by Mr. Carl Tylka, this new Cooper Alloy service has been set up to assist industry in solution of fluid handling equipment, design, and operational problems. It typifies Cooper Alloy's forward-looking approach to cooperation between user and supplier.

To set the ball rolling, just write to Carl Tylka, Technical Service Director—and you'll get action!

Check 4288 opposite last page

Low cost ground level loading anywhere . . . anytime . . . in any weather!

NEW MAGLINER MOBILE LOADING RAMP

with Non-Slip Grating Tracks



A LOADING DOCK ON WHEELS! *Magnesium Light . . . Magnesium Strong. One Man Moves It Where and When It's Needed!* Rugged bridge type construction . . . safely handles loads up to 16,000 lbs. Dependable service for many years.

NEW NON-SLIP GRATING TRACKS. Another Magliner First! Heavy duty, self cleaning grating sections provide permanent, slip-proof tracks built into the ramp. No power truck slippage due to rain, snow, oil, grease, etc.

ASK ABOUT THE MAGLINER PROOF POSITIVE PLAN . . . SEE A MAGLINER RAMP AT WORK. CUTTING COSTS RIGHT IN YOUR OWN OPERATION.

Write for Bulletin DB-211
Magline Inc., P. O. Box 433,
Pinconning, Michigan
Canadian Factory: Magline
of Canada, Ltd., Renfrew, Ont.

Check 4289 opposite last page

HEATING ELEMENTS

Designed to Your Specifications

TUBULAR HEATERS

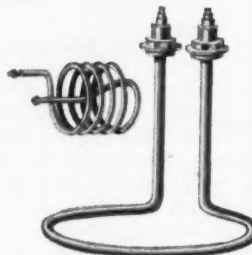
for Tanks, Kettles, Baths, Extruders

STRIP HEATERS

for Ovens, Dryers, Process Equipment

CARTRIDGE HEATERS

for Dies, Molds, Platens, Defrosting



OIL & WATER IMMERSION HEATERS

The Complete Line of TRENT Metal Sheathed Heating Elements Assures On-the-Spot Controlled Heat to Your Most Exacting Requirements.

WRITE FOR BULLETIN 74-TE.

TRENT INC.

Electrically Heated Industrial Equipment
235 LEVERINGTON AVE., PHILADELPHIA 27, PA.
In Canada Supreme Power Supplies Limited, Toronto 14

Check 4290 opposite last page

IDEAS

Straight-chain alcohols to be made by Conoco from petroleum

Will have from six up to 18 or higher carbon atoms

Straight-chain primary alcohols will soon be manufactured from petroleum by Continental Oil Company. The chemicals will have all even numbers of carbon atoms and range in chain length from six up through 18 carbon atoms or higher. They will be marketed under the trade name of "Alfol".

Most of the products have been available in the past, having been made from natural oils and fats by conventional processes. Conoco's process is based on work done by Dr. Karl Ziegler. A multi-million-pound annual capacity plant will be built by the company.

(Further information about Alfols may be obtained by writing to Continental Oil Co., Box 2197, Houston, Tex.)

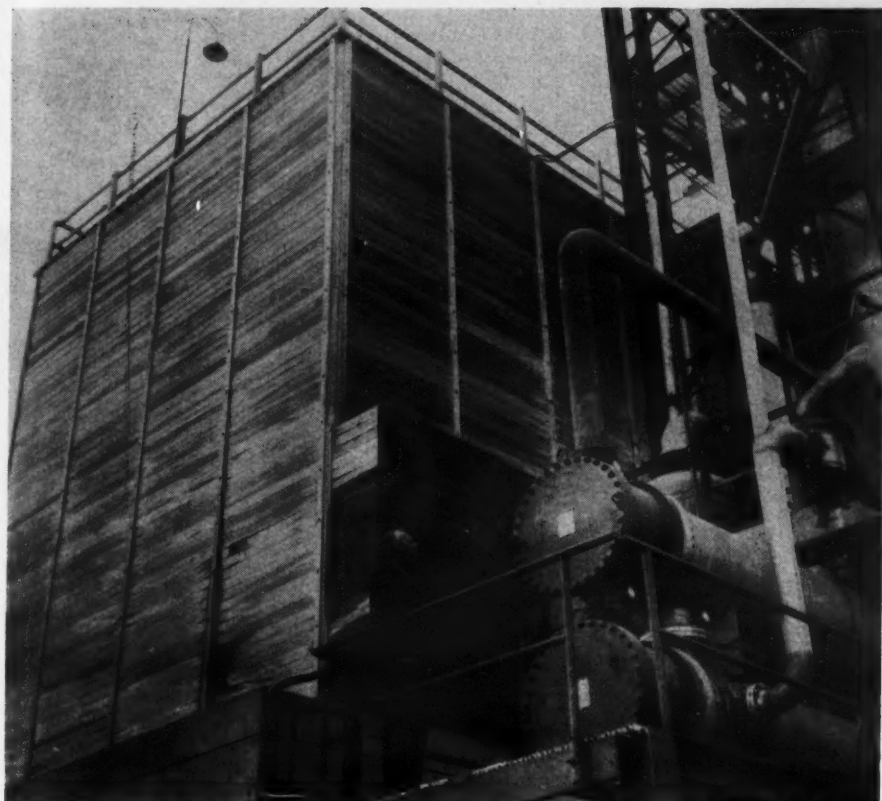
Meissner processes now available here

Girdler Construction Division of Chemetron Corporation is now acting as North American agent for German engineering firm of Joseph Meissner of Cologne. Meissner processes have applications in explosives industry and in manufacture of dyestuffs, plastics, and other products.

Girdler will handle all phases of design, construction, equipping and starting-up of plants, and translating design data and flow diagrams into terms of American standards, codes, and practices. Production of hexamine from ammonia and methanol, and continuous automatic nitration for aromatic hydrocarbons are examples of Meissner processes.

(Further information about Meissner processes may be obtained from Girdler Construction Division, Chemetron Corporation, 222 East Broadway, Louisville 1, Kentucky.)

Check 4291 opposite last page.



Two stainless exchangers cool nitrogen oxide gases before they pass to absorber (background at right) for production of 57% nitric acid

CP Staff Photo

Having satisfactorily handled
nitrogen oxide gases
for two years —

Stainless heat exchangers save petrochemical plant thousands of dollars

GORDON WEYERMULLER, Petrochemical Editor
with **IRVING C. ROTH**, Administrative Assistant
Cooperative Farm Chemicals Association
Lawrence, Kansas

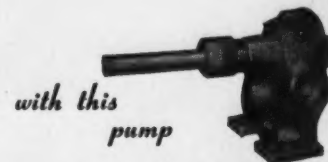
Problem: In similar types of service in the Lawrence, Kansas, plant of Cooperative Farm Chemicals Association and in other plants making nitric acid, heat exchangers handling highly corrosive gases required replacement every year or two. Reason for this was that conventional design and materials for handling acid at that time were not enough. Resulting failures were responsible for high replacement costs.

Solution: In early 1957, Cooperative Farm Chemicals Association installed two stainless steel exchangers for cooling nitrogen oxides, product gases from ammonia oxidation.

The gases are cooled from approximately 500° to 90°F before entering absorption towers to produce 57% nitric acid. The cooling medium is water. Subsequently the heated water is used as a source of heat for a liquid ammonia evaporator.

The new heat exchangers are 32" OD by 14' long, with pull through floating head type of construction. Each unit has 1305

Pump CORROSIVES



of STAINLESS STEEL and TEFLON

(Dupont's trademark for fluorocarbon resins, including tetrafluoroethylene resin).

Being used successfully by leading chemical companies. Write for literature.

LOBEE PUMP & MACHINERY CO.,
GASPORT, N.Y.

Since 1899 . . . Noted for Highest Quality Gear Pumps

Check 4292 opposite last page

BETTER PERFORMANCE

- Less slippage
- Longer life



Try Darcova Puncups in your reciprocating pumps and cylinders, and you too will realize what a big difference they make.

Because they are "engineered" for their job—in precisely controlled textures, shapes and types—and are noted for outlasting other packings at least 3 to 1! Why not get the advantage of this tremendous saving in maintenance and down-time?

Get all the facts

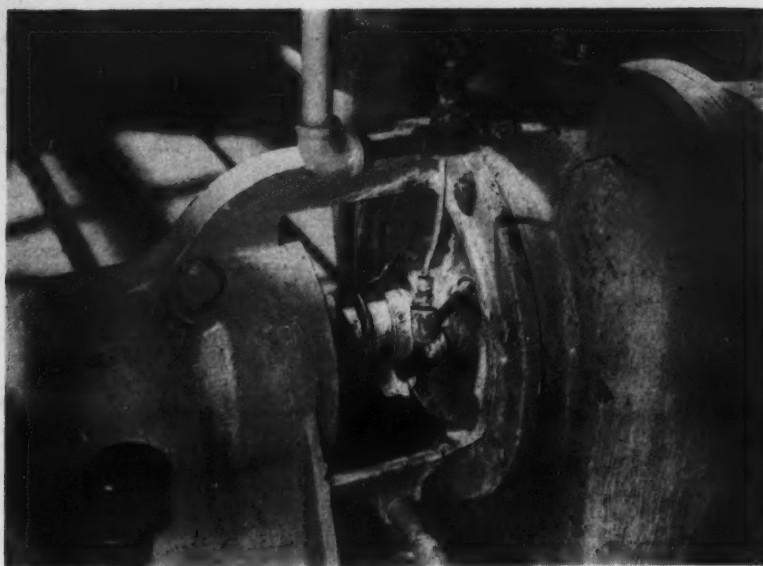
Send today for helpful Bulletin No. 5583.

DARLING VALVE & MANUFACTURING CO.
Williamsport 4, Pa.



TRADE MARK
Puncups

Check 4293 opposite last page



CHEMPRO MECHANICAL SEAL "HOLDS THE LINE" AGAINST 560,000,000 GALLONS OF ORANGE JUICE CONCENTRATE



In September, 1956, CHEMPRO MECHANICAL SEALS* were installed in 4 Allis-Chalmers high speed pumps located at the Minute Maid processing plant in Leesburg, Florida. The pumps recirculate orange juice through evaporators used to produce frozen orange concentrate.

So far, each pump and SEAL has handled approximately 560,000,000** gallons of concentrate. This service is so tough that most other previously used packings and seals needed frequent replacement. The original CHEMPRO MECHANICAL

SEALS are still in operation and there has been no leakage whatsoever in any of the pumps.

For information on CHEMPRO MECHANICAL SEALS IN TOUGH SERVICE, WRITE FOR BULLETINS CP-551 and 575.

*CHEMPRO MECHANICAL SEAL, Size 250 WLC, quenched, 316 stainless steel with Carbon vs. Ceramic Seal Faces.

**Pump handles 2,000 gal. of concentrate per minute and runs 24 hours per day, 7 days per week, for 7 to 8 months each year.



CHEMICAL & POWER PRODUCTS, INC.
The Original Fabricators of Teflon Packings and Gaskets

9 Broadway, New York 4, N. Y.

Check 4294 opposite last page

CORROSION CONTROL

sq ft of cooling surface, supplied by 473, 3/4" diameter, type 304 extra low carbon stainless tubes. Each unit consists of two shells mounted parallel to each other with the flow in series. Tubes are baffled for best heat transfer. The entire shell is also of type 304 stainless steel, with the exception of channel side and external bolting. Operating pressure is 100-125 psi.

Results: Based on previous experience, the two stainless exchangers have already saved the plant thousands of dollars through reduced maintenance, downtime and cost of replacement. After two years of service, excessive corrosion has been reduced. The exchangers are expected to continue to give good service.

(Stainless heat exchangers were manufactured by Western Supply Company, 424 N. Boulder St., Tulsa, Okla.)

Check 4295 opposite last page.

Modification for trucks broadens application to corrosive areas

Uses: To permit safe operation of industrial trucks in areas where corrosives are present.

Features: Drive and hoist motors are completely enclosed to achieve corrosion resistance.

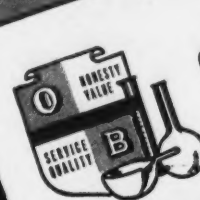
Description: Modification for rider-walkie type of industrial lift trucks involves applying phosphate coating to undercarriage linkage to protect moving parts. A special undercoating also is applied on non-moving parts in addition to use of corrosion-resistant coating on entire truck.

Grease fittings are provided at bearing points so bearings may be grease-flushed. Trail wheel bearings in truck are sealed to prevent introduction of foreign material.

(Worksaver truck modification developed by Yale Materials Handling Division, The Yale & Towne Manufacturing Company, 11,000 Roosevelt Rd., Philadelphia, Pa.)

Check 4296 opposite last page.

It's a mark of quality!

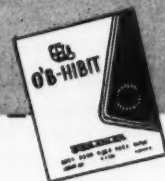


O'B-HIBIT
CORROSION
INHIBITOR

You're seeing more and more of this label lately.... so if you formulate **SULFAMIC ACID** you can use this label...

The manufacturer of an **ACID CLEANER** who displays this label on his product indicates he is using the finest Corrosion Inhibitor available.

For complete information on O'B-HIBIT and the distributors in your area, write:



O'B-HIBIT
P. O. Box 72
Coldwell, N. J.

Gentlemen:

Please send complete information on O'B-HIBIT Corrosion Inhibitor.

Name

Address

Check 4297 opposite last page

CHEMICAL PROCESSING

THAT'S
INTERESTING

**Quartz
thread**

One of the most heat-resistant materials on earth for its weight, a quartz thread, has been developed by General Electric. It was successfully woven into cloth on textile equipment. Key to discovery is ability of quartz thread and cloth to withstand elevated temperatures and still retain tensile strength in excess of other textiles.

**Just change
the oil**

The greaseless auto may be with us by 1961 or at least by 1963, according to Esso Standard Oil exec. The number of auto grease fittings has dropped 56% since 1951, and should be entirely gone by 1961 or '63.

(Industrial Research Newsletter, Armour Research Foundation of Illinois Institute of Technology)

For more information on product at right, specify 4298 see information request blank opposite last page.



QUALITY

IN STAINLESS STEEL

Quality in stainless steel starts in the melt shop, where Industry Standards are met — or missed.

1 out of every 7 tons of stainless used in the last 15 years came from the melt shop of J&L's Stainless and Strip Division. To achieve that remarkable record as a supplier of semi-finished products, J&L set up its own standards and specifications — far more exact, more precise, *more rigid* than those in general use. Today J&L leads the industry in melting practice standards — the point where quality starts.

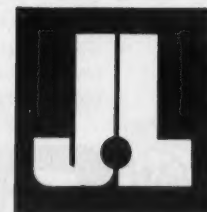
Chances are 1 out of 7 you have already enjoyed J&L quality in stainless, without knowing its melt shop origin. Now you can eliminate chance! Newly installed cold rolling and finishing equipment in operation at Louisville, Ohio, makes J&L the most modern *integrated* source for *finished mill products* — stainless sheet, strip, bar and wire. All of traditional J&L stainless quality.

On your next stainless steel order specify "J&L Consistent Quality." Don't pay for less.

Plants and Service Centers:

Los Angeles • Kenilworth (N. J.) • Youngstown • Louisville (Ohio) • Indianapolis • Detroit

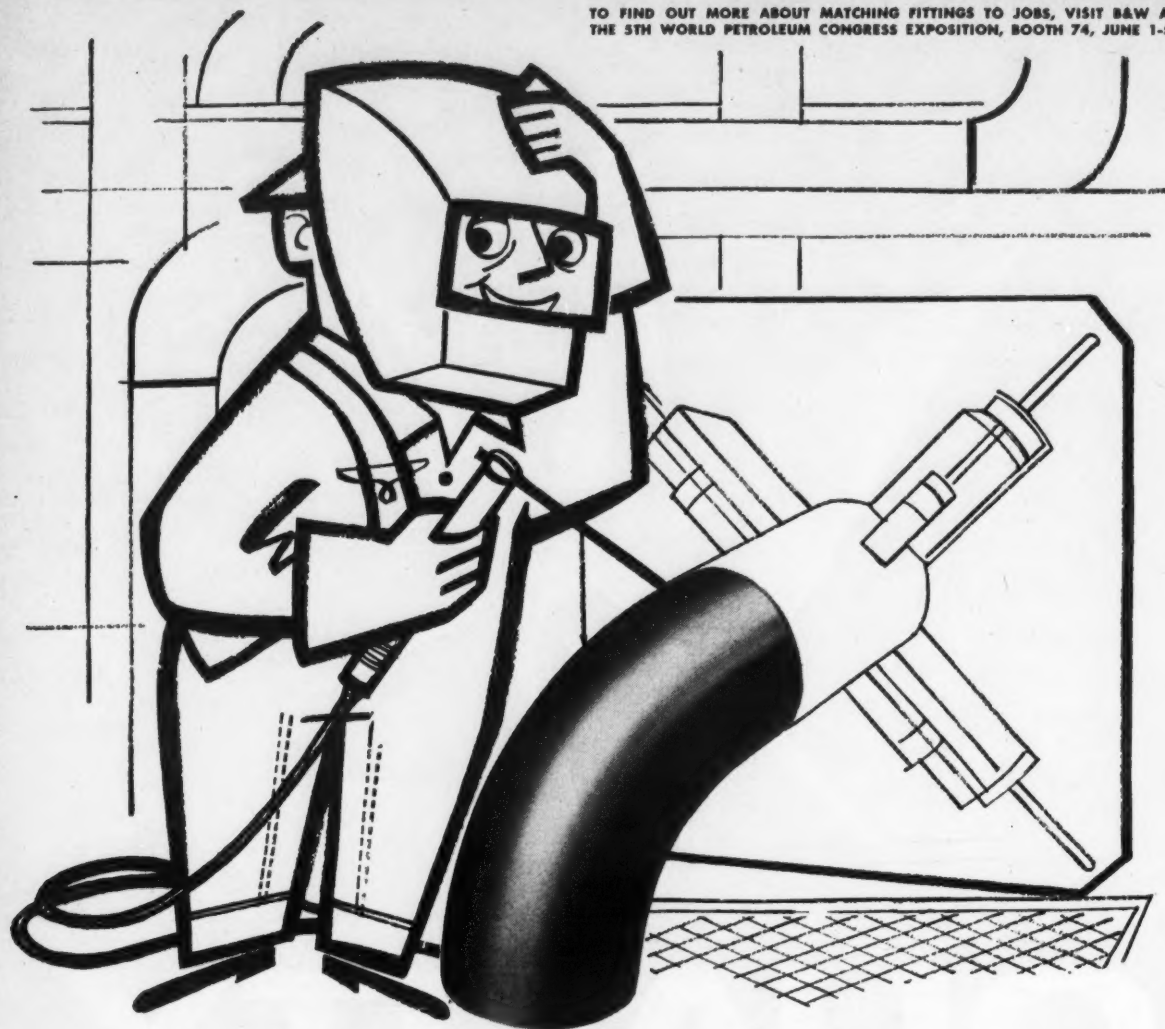
"FLIGHT OF PROGRESS"
a stainless steel sculpture by Robert Edward Hamilton



STAINLESS
SHEET • STRIP • BAR • WIRE

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Box 4606, Detroit 34

TO FIND OUT MORE ABOUT MATCHING FITTINGS TO JOBS, VISIT B&W AT THE 5TH WORLD PETROLEUM CONGRESS EXPOSITION, BOOTH 74, JUNE 1-5.



B&W JOB-MATCHED WELDING FITTINGS

make piping pre-fabrication more economical

Dimensional accuracy is the key to economical pre-fabrication and installation of process piping . . . and you get true accuracy with B&W Job-Matched Welding Fittings. This means:

- during fabrication sections can be pre-cut and you know they will fit
- welding time is reduced because there are fewer fit-up problems, eliminating time consuming and costly fill-in welding

- fabricated sections can be installed without delays because each fitting is well within tolerance.

Ask for B&W Job-Matched Welding Fittings through local B&W District Sales Office or any qualified welding fittings distributor, or write for B&W Bulletin FB-504, The Babcock & Wilcox Company, Tubular Products Division, Fittings Department, 3839 West Burnham Street, Milwaukee 46, Wisconsin.



B&W

THE BABCOCK & WILCOX COMPANY

TUBULAR PRODUCTS DIVISION, FITTINGS DEPARTMENT

TA 9023 WF1

Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals

Check 4299 opposite last page

CORROSION CONTROL

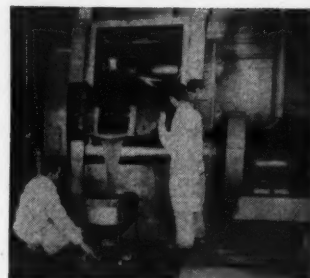
Stainless steel alloy casts out mixing blade corrosion

Cast stainless steel blades are used by Thiokol Chemical Corporation of Trenton, N.J., in mixers to combine polysulfide organic fuel with inorganic oxidizer, in production of solid rocket fuel.

Blades have corrosion resistance and mechanical strength in wide range of temperatures and corrosive environments.

Use of stainless steel alloy instead of carbon steel markedly reduces corrosion due to contact with fuel components. Casting of blades, rather than producing from wrought shapes, eliminates welding corrosion.

Cleaning is accomplished by running through mixture of sawdust, water, and detergent. One-step operation is suffi-



Operators pour molten rocket propellant from mixer

cient due to lack of corrosion and smooth-contour design of blades. Since batches of differing composition may be prepared successively in same mixer, this fast, easy cleaning is important.

For some highly viscous fuel mixtures, vacuum mixers are being used. While materials are in agitation, volatiles can be removed. Removal of occluded gases can prevent oxidation. Air will not work into mix during operation.

Chemical composition of cast stainless steel type CF8M (Alloy Casting Institute designation) is as follows: 19% Cr, 10% Ni, 2-3% Mo, and 0.08% max C.

(Baker Perkins mixers are a product of Baker Perkins Inc., Saginaw, Mich.)

Check 4300 opposite last page.

CHEMICAL PROCESSING

CORROSION CONTROL

Low nickel content in stainless steel

Austenitic in all conditions

Uses: As strong, hard, corrosion-resistant material for service in temperature range of 900 to 1600°F.

Features: Resistant to erosion, oxidation, and corrosion, non-magnetic alloy is austenitic in all conditions, in spite of economical low nickel content. Maintains high degree of hardness and strength at elevated temperatures.

Description: Chemical composition of the stainless steel is as follows:

Carbon	0.45-0.60
Manganese	7.00-10.00
Phosphorous	0.045 max
Sulfur	0.12 max
Silicon	1.00 max
Chromium	20.00-23.00
Nickel	3.00-5.00
Nitrogen	0.30-0.50

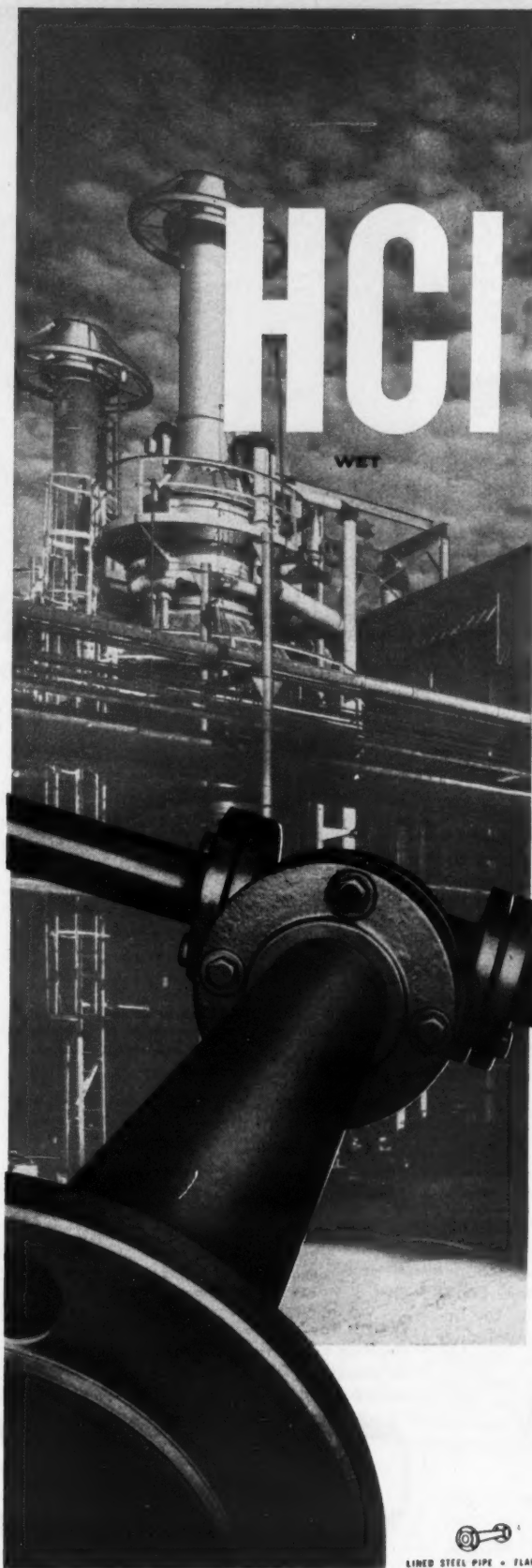
At room temperature, alloy exhibits controlled hardness between Brinell 300 and 500, depending on processing method. With initial room-temperature hardness of Brinell 344, it exhibited hot hardness of Brinell 250 after 1000 hours at 1100°F. Material is available as forging billets and rounds from 3/8 to 3".

(Armco 22-4-9 stainless steel is a product of Armco Steel Corporation, Middletown, O.)

Check 4301 opposite last page.



"Stand still when I'm talking to you!"



**hydrochloric acid—to 500°F,
in any concentration,**

CAN'T CORRODE FLUOROFLEX®-T PIPE

Lining is completely inert to all corrosives. It's made of Fluoroflex-T, a high density, non-porous compound* of virgin Teflon.

Liner and housing are in thermal equilibrium through an exclusive process developed by Resistoflex. It compensates for thermal expansion differential between the Teflon and the pipe housing, eliminating fatigue collapse, and cracking at the flange.

Saves \$60,000 monthly at one chemical processing plant. Frequent piping failures cost that much in excessive maintenance and product loss. An exhaustive search among all types of piping uncovered only one system that could handle the mixture of 25% hydrochloric acid and organic solvents at 300°F and 100 psi without difficulty—Fluoroflex-T Type S piping. With over 1500 feet and 400 fittings now in service—some for more than 18 months—there have been *no failures*.

Fluoroflex-T Type S piping systems can handle the toughest problems of corrosion, erosion and contamination for you, too, with complete safety. Send for Bulletin TS-1A. Dept. 216, RESISTOFLEX CORPORATION, Roseland, N. J. Other Plants: Burbank, Cal., Dallas, Tex.

© Fluoroflex is a Resistoflex trademark, reg., U. S. pat. off.
© Teflon is DuPont's trademark for TFE fluorocarbon resins

* Pat. No. 2,752,637

liner of TEFLON®
in thermal equilibrium with housing
... the only Teflon Lined pipe with
proven performance record

RESISTOFLEX

Complete systems for corrosive service



Check 4302 opposite last page

first

**ZIRCONIUM
PUMPS**

**ECO "GEACHEM"
NOW MASS-PRODUCED
FROM
FORMER RARE
ALLOY**

**COMMERCIALY
PRICED FOR**

**STANDARD
PROCESS SERVICE
REQUIRING RESISTANCE
TO HOT CORROSIVES
SUCH AS**

HCl at 300°F

No contamination of acid with metallic salts through progressive dissolution, as with other metals. Wear-compensated, chemically-inert Teflon Gears. Grease-sealed stuffing box—Leak-proof against pressure or vacuum in open or closed loop systems. Write for details.

**ECO ENGINEERING
COMPANY**

12 New York Ave., Newark, N. J.

Check 4303 opposite last page

CORROSION CONTROL

**PVC expansion joint
has traverse
of 4 inches**

A rigid polyvinyl chloride expansion joint which has a maximum traverse of four inches has recently been introduced to industry. The joint



Polyvinyl expansion joint has special O-ring for tight seal

compensates for variations in length on long straight runs of both normal impact and high impact PVC pipe due to temperature changes.

Specially designed O-rings assure an absolutely tight seal. The joint is designed to hold at pressures well above five times the maximum recommended pressure for equivalent size Schedule 80 pipe.

(Rigid PVC expansion joint is product of the Walworth Company, 750 Third Avenue, New York, N. Y.)

Check 4304 opposite last page.



Quick-coupling filter

... with fine mesh for all liquids has Monel or 316 stainless screens. Quick couplers on inlet, outlet, and body enable filter element to be cleaned quickly without using tools. Elements can be reused many times. They are made in 20 to 700 mesh, and are designed to withstand pressures to 300 psi and temperatures to 450°F.

(Quick-coupling filter is development of Ronningen-Petter Company, Vicksburg, Mich.)

Check 4305 opposite last page.



Reduce Maintenance Coating Costs— Carboline Systems are Keyed To Your Job

Many maintenance paint dollars are wasted on so-called "cheaper" paints. Moreover, no one coating system can perform equally effectively under all conditions. Either way premature failures occur, requiring costly re-painting. You can substantially cut maintenance costs by specifying systems that are keyed to your requirements.

Four Carboline maintenance coating systems, thoroughly proven in service, are recommended for specific corrosive environments. Each system is "keyed" or tailor-made for a particular type of job. And each is designed to provide maximum protection for the longest time at the lowest cost per square foot per year of service.

CONDITION 1

Mild fumes, splash or spillage of most acids and alkalis. Continuous temperatures to 150°F. where maximum surface preparation is not practical. Structural steel, pipe, walls, equipment exteriors. Carboline CS-200 (all vinyl) system.

CONDITION 2

Severe fumes, splash or spillage of acids and alkalis. Continuous temperatures to 180°F. Structural steel, equipment exteriors, concrete walls. Carboline Epoxy 188.

CONDITION 3

Heavy duty protection against solvent, caustic and acid spillage. Continuous temperatures to 200°F. Structural steel, equipment exteriors, concrete. Carbomastic #3 (epoxy tar) and Phenoline 305 topcoats.

CONDITION 4

Economical, easily applied maintenance system for mild chemical fumes. Requires minimum surface preparation. Continuous temperatures to 200°F. Can be used over old paints. Carboline Epoxy 110.

Write for newly released Chart No. 5 showing comparative ratings of coating systems by physical and chemical properties—an engineering aid in choosing the most efficient protection. Also ask for technical data and recommendations on Carboline maintenance systems.

carboline
C O M P A N Y

32-B Hanley Industrial Ct.
St. Louis 17, Mo.

Atlanta • Buffalo • Denver • Detroit
• Houston • Los Angeles • Mobile
• New York • Pittsburgh • San
Francisco • Tampa • Tulsa • Toronto

**Specialists
in Corrosion Resisting
Coatings and Linings**

Check 4306 opposite last page

CHEMICAL PROCESSING

**THAT'S
INTERESTING**

**This, we can
do without**

An automatic household siren called the Banshee warns of nuclear fallout and guides the family to safety. The device plugs into any standard radio or television set and sounds a wailing alarm through the loud speaker when exposed to radioactive fallout in dangerous concentrations. With auto or portable radio it can lead family out of danger areas. Pitch of wail rises or falls as amount of radioactivity increases or decreases.

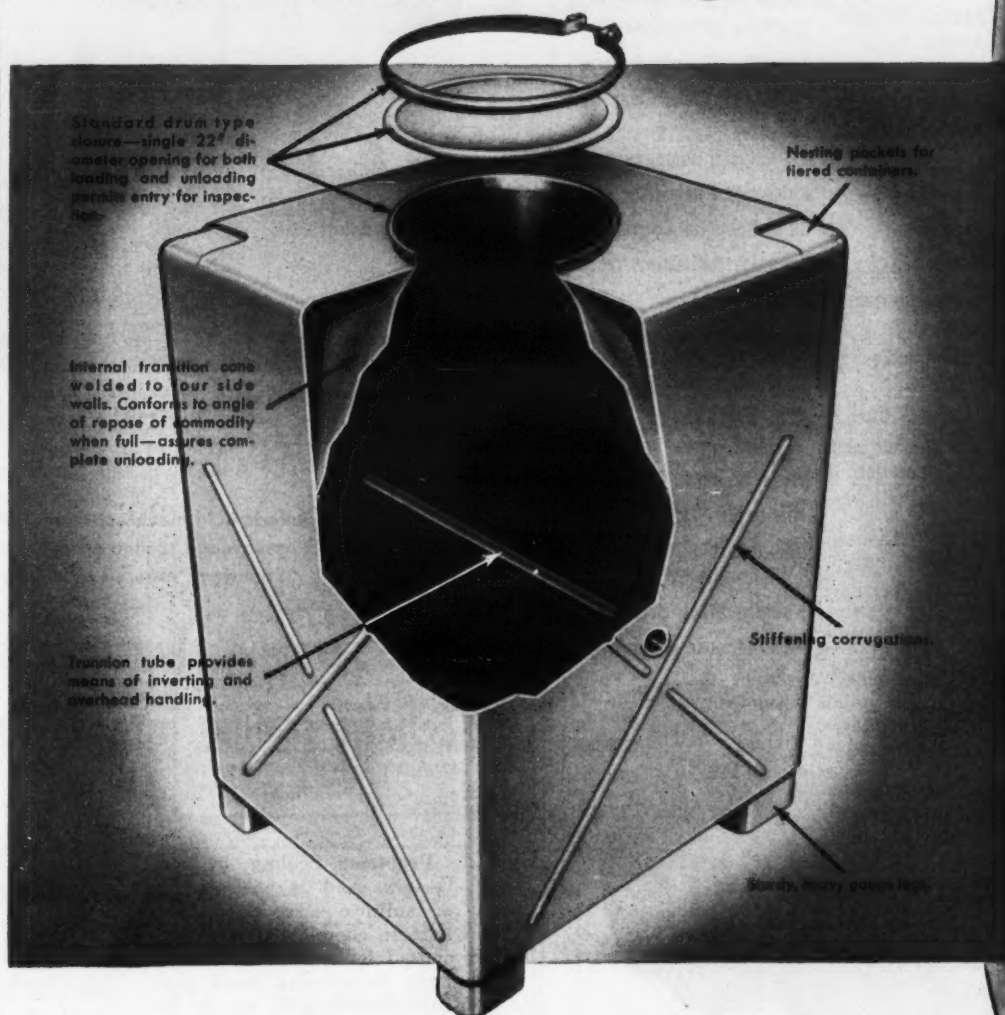
**Agree on
yard, lb**

Directors of standards labs in Canada, New Zealand, United Kingdom, South Africa, Australia, and the United States have agreed to adopt an international yard and pound. The yard will equal 0.9144 metre; the pound 0.453 592 37 kilogramme.

For more information on product at right, specify 4307 see information request blank opposite last page.

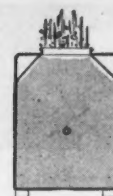


New Powell **Invert-a-bin** slashes bulk handling costs

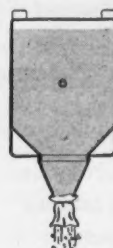


For bulk handling dry granular or powdered materials—sugar—flour—plastics—chemicals—cement—etc.—in plant or between plants, the new patented Powell Invert-A-Bin made of steel or aluminum is the simplest, most versatile container ever developed.

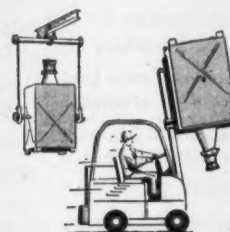
Easily filled, easily inverted, quickly emptied, the Invert-A-Bin can be used anywhere without special devices at each use point. It stores safely outside, lets you take advantage of many transportation economies. Invert-A-Bins eliminate the use of disposable packages and bring you all the advantages of a bulk handling system without the costly investment. Get all the facts—write today for your copy of the Invert-A-Bin, Semi-bulk handling brochure.



Fills Fast—22" opening permits fast filling of even powdered materials. Internal cone conforms to angle of repose.



Empties Clean—Internal cone funnels all materials out of bin. No residue remaining.



Used Anywhere—Standard handling equipment—no fancy unloading devices needed at every use area.



Stores Outdoors—Weather-proof, turns yard area into warehouse. Stacks 2 high.



Cuts Shipping Costs—low cost flat-bed equipment considered part of special rail car with "freight free" advantages.



THE POWELL PRESSED STEEL COMPANY

HUBBARD, OHIO



Partial list of companies using Ampco Centrifugal Pumps.

Abbott Laboratories
Adolph Coors Company
Allen-Bradley Company
Allied Chemical Corporation
Alox Corporation
American ENKA Corp.
The American Pulley Co.
Blatz Brewing Company
Brown & Williamson Tobacco Corporation
Bristol Laboratories, Inc.
Chagrin Chemicals, Inc.
Cincinnati Cleaning & Finishing Machinery Co.
City Water and Sewer Dept. Forrest City, Arkansas
Colton Chemical Co., a Div. of Air Reduction Co., Inc.
Consolidated Edison Co.
Continental Oil Company
Corn...
C...

Del Monte Foods
Emulsol Chemical Corp.
Enterprise Paint Mfg. Co.
Evans Cooperage Co., Inc.

The Fenn Manufacturing Co.
Ford Motor Company
General Chemical Division, Allied Chemical Corp.

The Genesee Brewing Company, Inc.

A. Gettelman Brewing Co.

Globe-Union, Incorporated

Graver Water Conditioning Co.

Peter Hand Brewery Co.

Huntington Laboratories, Incorporated

Independent Milwaukee Brewery

Industrial Dyestuff Co.

International Minerals and Chemical Corporation

Jones & Laughlin Steel Corporation

Koppers Company, Inc.

Kraft Foods Company

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Master Lock Company

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Miller Brewing Company
Modern Tool & Die Co.
Monsanto Chemical Co.

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National Aluminate Corp.

Patek Brothers, Inc.

Parke, Davis & Company

The Pure Oil Company

Petro-Tex Chemical Corp.

Pittsburgh Plate Glass Co.

Red Star Yeast & Products Company

Reichhold Chemicals, Inc.

Shell Chemical Corporation

Schenley Industries, Inc.

S. G. Taylor Chain Company, Inc.

Texas Butadiene & Chemical Corporation

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Visco Products Co., Inc.

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Companies with a critical eye on the cost of pumping corrosives use

AMPCO® CENTRIFUGAL PUMPS

Stainless steel, Ampco Metal, Illium "G", elastomer- and rubber-lined pumps — available from stock. Engineered to resist velocity corrosion, and erosion. Special-pump features at standard-pump prices.

Let your Ampco Field Engineer help you cut pumping costs.

Write us for his name.



AMPCO METAL, INC. DEPT. 139C, MILWAUKEE 46, WISCONSIN
West Coast Plant: Burbank, Calif. • Southwest Plant: Garland (Dallas County), Texas

Check 4308 opposite last page

CORROSION CONTROL



In contact sulfuric acid plants, metallizing has reduced catalyst fouling, increased production

In sulfuric acid manufacture, hot SO₂ and SO₃ gas caused scaling of steel converter housings, lowered efficiency

Sprayed aluminum coating halts scaling in SO₂ converters

Problem: Scaling in converters used in manufacture of sulfuric acid at a large Eastern chemical producer caused fouling of the catalyst beds. As a result, back pressure would build up to impede gas flow, efficiency was impaired, and output decreased.

Catalyst beds transform SO₂ gas into SO₃. Catalyst, vanadium pentoxide pellets, is laid in beds supported by a perforated steel grid and protected top and bottom by a layer of quartz pebbles. Gas is passed through system at temperatures ranging from 850 to 1140°F. Hot gas passing through steel converter housing and ducting, caused a formation of a thin, hard scale which fell from overhead surfaces onto catalyst beds. Velocity of gas is sufficient

to carry scale which forms in ducting into the converters. Severity of scaling was in direct proportion to number of periodic shutdowns for routine cleaning and repair.



Applying aluminum coating to a section of sulfuric acid plant duct work

Solution: In 1952 the two SO₂ converters in this system were metallized. The following procedure was used:

- 1) Surfaces were rough blasted, flame cleaned to loosen hard scale and burn out any residue on the steel, and then re-blasted. This first step is vitally important because, unlike paint, sprayed metal has no wetting effect and therefore any residual material adhered to and imbedded in the surface would tend to decrease the bond strength between the base metal and the metallic film.
- 2) A flash coat of sprayed steel was used to increase the bond strength between base metal and sprayed aluminum.
- 3) A sprayed aluminum coating was applied. Aluminum wire, 99%, 1/8" or 3/16" in diameter, was utilized. Application was by a conventional metal spray gun.
- 4) Coating thickness was checked and surface sealed with heat-resistant, aluminum-pigmented silicone paint.

Sprayed metal coating should be applied to steel surface as soon as possible after it is prepared. Maximum elapsed time should not exceed 8 hours, less if humidity is high or temperature variations are extreme.

Results: In 1956, during a periodic shutdown, lining was inspected. Coating on heavy steel shell showed no evidence of deterioration, with the exception of a few small spots in contact with the catalyst. As a result of metallizing the converters and adjoining equipment, catalyst requires cleaning less frequently. Daily av-

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

Why a Steam Trap Has to Handle "Air"

Low temperatures and corrosion of equipment are often evidence of inadequate trap air venting capacity

Air, with its load of oxygen and carbon dioxide, has an unwholesome habit of interfering with the efficiency of steam heated units. If steam were always free of these undesirable companions, things would be a lot simpler for men-who-operate-plants. Because it isn't, three unhappy situations frequently occur:

1. Operating temperatures are subnormal. This is a two-part problem. First, an air-steam mixture has a lower temperature than pure steam at the same pressure—see Table A. Secondly, air can "plate out" on heat transfer surfaces as shown in Figure 1. Under some conditions, such an air film will knock down heat transfer efficiency by as much as 50%.

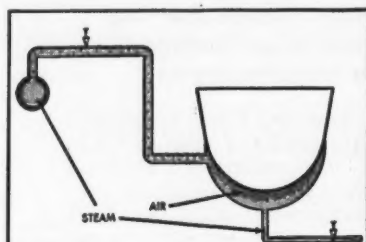


Fig. 1. How air can "plate out" on heat transfer surfaces. This "insulation" drastically reduces heat transfer efficiency. Armstrong trap operation creates turbulence in the equipment that prevents this.

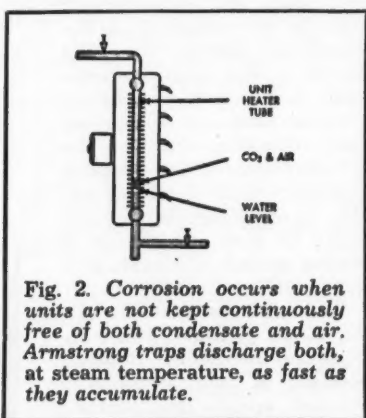


Fig. 2. Corrosion occurs when units are not kept continuously free of both condensate and air. Armstrong traps discharge both, at steam temperature, as fast as they accumulate.

2. Corrosion rears its ugly head. Oxygen and carbon dioxide are real trouble-makers. CO₂ gas goes into solution in condensate, forms carbonic acid and chews away at vulnerable metal sections. O₂ aggravates the situation. See Figure 2.

TABLE A—How air reduces steam temperature.

Gauge Pressure	Temp. of Steam with No Air Present	Temp. of Steam Mixed With Various Amounts of Air (% Air by Volume)	
		10%	30%
10.3	240.1	234.3	220.9
25.3	267.3	261.0	246.4
50.3	298.0	291.0	275.1
75.3	320.3	312.9	295.9
100.3	338.1	330.3	312.4

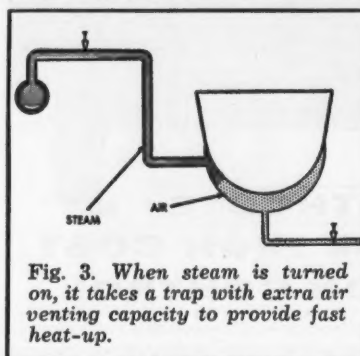


Fig. 3. When steam is turned on, it takes a trap with extra air venting capacity to provide fast heat-up.

3. Heat-up is slow as a snail. Air has a picnic in units that are shut off periodically. Figure 3 pictures the problem. Lines and equipment literally fill up with air. When the steam is turned on it can get in only as fast as the air gets out.

Enter Steam Traps

Curing these steam system ailments involves an operation sometimes called a "trap transplant." It consists of removing traps that don't get the air out and replacing them with traps that do.

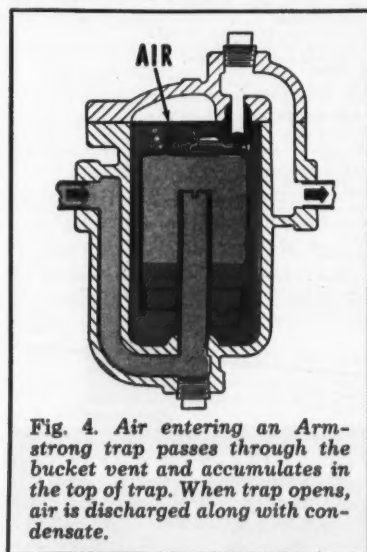


Fig. 4. Air entering an Armstrong trap passes through the bucket vent and accumulates in the top of trap. When trap opens, air is discharged along with condensate.

Figure 4 shows how an Armstrong inverted bucket trap continuously vents air. What the picture doesn't show is a built-in plus-value of this trap's design. An Armstrong trap opens suddenly, creating a momentary pressure drop and turbulence in the unit being drained. This breaks up air films and "pumps" air down to the trap so it can be vented.

The vents in standard Armstrong trap buckets will pass all the air normally encountered. In special cases, such as paper machine dryers, the vents are correctly sized larger at the factory to meet the requirement.

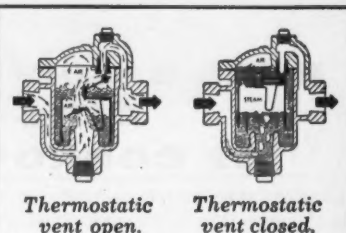


Fig. 5. Open float with thermostatic vent for off-and-on units. When trap is cold, vent is open, permitting air to blow through when steam is turned on. When steam reaches trap, heat closes thermostatic vent. Then, regular bucket vent handles all air coming in with steam.

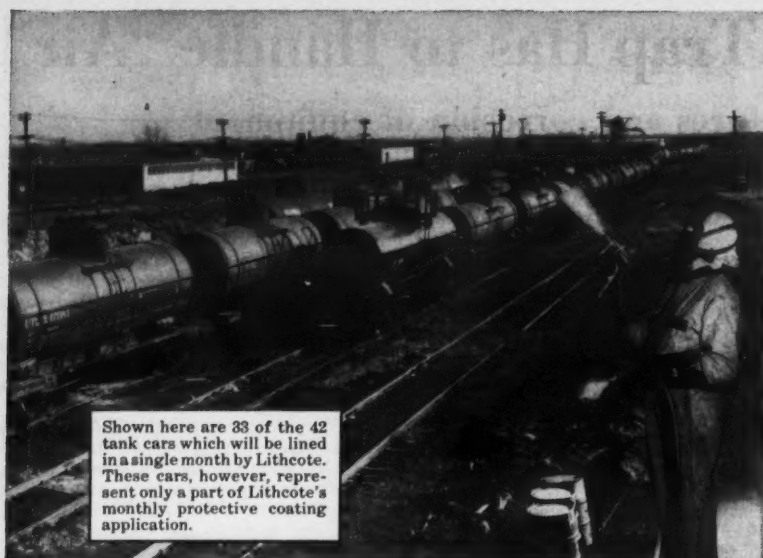
Open Float with Thermostatic Vent

Super air-venting capacity is a must for fast heat-up of low pressure unit heaters, heating coils, steam headers and other units that are on-and-off. Figure 5 shows how the Armstrong open-float-with-thermostatic-vent trap takes care of this.

The 44-page Armstrong steam trap book covers other features of the Armstrong trap as well as its excellent air handling characteristics. This catalog also discusses trap selection, installation and maintenance. Your local Armstrong Representative or Distributor will be glad to give you a copy. Call him, or write Armstrong Machine Works, 8806 Maple Street, Three Rivers, Michigan.

ARMSTRONG STEAM TRAPS

Check 4309 opposite last page



Shown here are 33 of the 42 tank cars which will be lined in a single month by Lithcote. These cars, however, represent only a part of Lithcote's monthly protective coating application.

HERE'S HOW LITHCOTE CUTS THE HIGH COST OF CORROSION CONTROL

Lithcote Corporation is a corrosion and contamination control *specialist* . . . a pioneer in the manufacture and application of internal and external protective coatings for equipment of all kinds.

Only durable, proved baked-on linings and coatings are applied by Lithcote Corporation—our own time-tested Lithcote line as well as the best of the many other recognized name brands. Furthermore, with our new oven equipment, sprayed Plastisol (PVC) materials may now be applied to *any piece of equipment which can be transported by truck or rail*. Plastisols provide for the resistance of sheet rubber *without seams*, in thicknesses up to 1/8".

Lithcote is also your dependable source for:

AMERCOAT, BISONITE, COLUMBIA #7, COPON, PLASITE, UNICHRONE,

PARTIAL LIST OF EQUIPMENT COATED OR LINED BY LITHCOTE

PROCESSING

STORAGE TANKS
TANK CARS
VACUUM TANKS
EDIBLE OIL TANKS
FATTY ACID TANKS
FILTER PRESSES
FRUIT JUICE CONTAINERS
LIQUID SUGAR TANKS

TRANSPORTATION

The many products transported in Lithcote lined tank cars and trucks include:

LATEX
FORMALDEHYDE
ACETALDEHYDE
INVERT SUGAR
EDIBLE OILS
VINEGAR
TALL OIL
CAUSTIC SODA
CARBON
BISULPHIDE
PLASTICIZERS
EMULSIONS
CARBON
TETRACHLORIDE

TRAYS
DRYING EQUIPMENT
CHEESE VATS
MILK STORAGE TANKS
WHEY TANKS
CARBONATED BEVERAGE EQUIPMENT
WATER TREATING EQUIPMENT

CHEMICAL AND PHARMACEUTICAL

STORAGE, MEASURING, FERMENTING AND MIXING TANKS
CAST IRON FILTER PRESS PLATES AND FRAMES
VACUUM DRYERS, INCLUDING DRYER PANS
EXHAUST FANS AND DUCT SYSTEMS
PIPE AND FITTINGS
CENTRIFUGES AND CENTRIFUGAL BASKETS
PUMP CASINGS AND OTHER PARTS
AGITATORS AND MIXING EQUIPMENT
TRUCK TANKS
RAILWAY TANK CARS, VALVES
TROUGH, HOPPERS AND CONVEYORS

PULP AND PAPER

WAGO FILTER VATS AND CYLINDERS
PERFORATED AND SLOTTED SCREEN PLATES
FOURDRINER PARTS
INLET AND OUTLET BOXES
HEAD BOXES
SAVEALL and DECKER VATS
WHITE WATER BOXES
STOCK CANALS
STOCK VALVES
PUMP CASINGS
FEEDWATER TANKS
REGULATOR AND INDICATOR BOXES

PETROLEUM

The same Lithcote experience in corrosion control is available to the Petroleum Industry for the internal and external coating of pipe and other equipment.

LITHCOTE

ASK FOR YOUR LITHCOTE CATALOG



LITHCOTE CORPORATION

5000 W. Lake St., Melrose Park, Ill. • 42 Bolden Ave., Norwalk, Conn.
36 W. 44th St., New York 36, N. Y.

CORROSION CONTROL

erage production has been increased about 5%. Former trouble with increasing back pressure and impaired efficiency is no longer encountered.

(Metallizing was performed by Metalweld, Inc., Protective Coatings Div., Scotts Lane & Abbottsford Ave., Philadelphia 29, Pennsylvania.)

Check 4311 opposite last page.

(Aluminum wire and aluminum-silicone paint were supplied by Metallizing Engineering Co., Inc., 1105 Prospect Ave., Westbury, Long Island, New York.)

Check 4312 opposite last page.

Metal-ceramic seal ring stops pump leakage in corrosive service

Problem: Pump seals failed in a matter of days or weeks in the handling of a slurry of alkyl benzene and oleum. Corrosive conditions of this slurry compare in severity to the handling of 98% sulfuric acid. The slurry is also very abrasive.

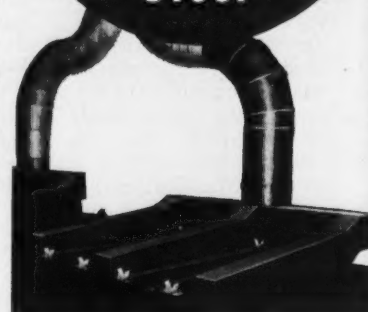
Many pump seal materials were tried but failed because of corrosion, fragility, galling, or excessive wear.

Solution: A mechanical seal ring made of metal-ceramic material was installed on the centrifugal pump. The ring combines the high-temperature and corrosion-resistant characteristics of chromium and aluminum oxide. The metal-ceramic seal remains stationary while a carbon seal ring turns against its interface. Tight fit and smoothness of sealing surface effectively prevent passage of fluid.

Seal works at 1750 rpm under 25 psi pressure. The temperature is 100°F. Rotating element of seal, contains a retainer, spring, disc, and set screws made of "Hastelloy" alloy C for extra corrosion resistance.

Results: Mechanical seal ring made of metal-ceramic material is providing six months or more service in the handling of highly corrosive slurry. Also, this type of seal has

AGILE'S Plastic Ductwork Costs Less...Has Longer Service Life Than Stainless Steel



AGILE'S Plastic Installation

- Cost \$491.00
- Service....Still in use after 5 years

Stainless Steel Installation

- Cost \$581.00
- Service....only 16 months

PROBLEM: This company was using a type 19-9 stainless steel stack for venting the fumes on a sulphuric acid tank. This stack was installed at an original cost of \$581, was no longer serviceable after 16 months because of corrosion.

SOLUTION: The company replaced the stainless steel installation with a plastic structure of equal dimensions for \$491.00. The new stack still in perfect condition, has a life expectancy of many, many years.

Whenever you have a corrosion problem, check with American Agile. Many years of research and wide practical experience have made American Agile experts in the fields of plastics and corrosion prevention.

For detailed information be certain to write for your free brochure . AA-4



American Agile Corp.

Plant and General Office
5461 Dunham Road • Maple Heights (Suburb of Cleveland), Ohio
Mail Address • P. O. Box 148, Bedford, Ohio

Check 4310 opposite last page

Check 4313 opposite last page

CHEMICAL PROCESSING

CORROSION CONTROL

eliminated downtime formerly required to change packing after leakage was observed.

(Mechanical pump seal ring of metal-ceramic LT-1 is product of Haynes Stellite Co., Div. of Union Carbide Corp., Kokomo, Ind.)

Check 4314 opposite last page.

(Mechanical pump seal is product of Crane Packing Co., Morton Grove, Ill.)

Check 4315 opposite last page.

Steel tank rubber-lined to avert contamination

Rubber lining has been used to prevent metallic contamination of liquid detergent ingredients in steel blending tank fabricated for Sinclair Manufacturing Company, Toledo, Ohio.

More than 1000 lb of crude rubber were used for the



Steel tank sections lined with rubber will be fashioned into gigantic liquid detergent blender

3/16" lining. When assembled, tank sections will form an elliptical container 18 ft long, 9 ft wide and 16 ft deep. Sinclair manufactures liquid detergents for household use.

(Rubber lining was fabricated by B. F. Goodrich Industrial Products Company, Akron, Ohio.)

Check 4316 opposite last page.

Plastic fans are depicted in bulletins which include performance tables and drawings. Types available are centrifugal, in sizes from 10-1/2 to 35" (10-page Bul 9-20), and twin-flow, in sizes from 12 to 48" (4-page Bul 9-21) — The Atlas Mineral Products Company, Mertztown, Pa.

Check 4317 opposite last page.

COOPER ALLOY

VALVE

BRIEFS

THE VALVE AND FITTINGS ANSWER CORNER



Carl Tylka, Cooper Alloy Technical Service Director, answers your questions on stainless valves and fittings.

Q. How can one remedy a hydraulic hammer produced in a piping system during closing of a motor-operated gate valve?

A. Hydraulic hammer indicates an excessive pressure buildup rate caused by too rapid a valve closing cycle. Lengthening the time of closure will eliminate this condition.

Q. What to do about interruption of closure of motor-operated gate valve caused by the torque switch cutting out when in the near-closed position?

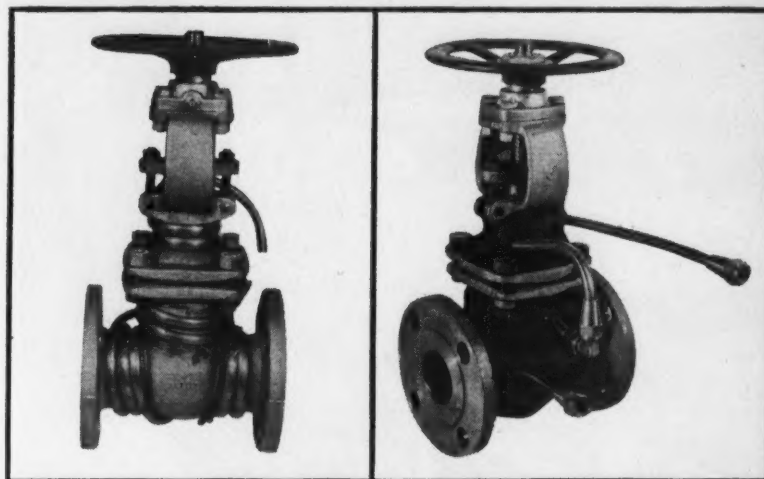
A. Increase the spring load in the operator torque cutout. Obviously, the disc when approaching the closed position develops across it larger pressure drops and resulting friction, which requires operating power in excess of the maximum passable through the torque cutout.

Q. Does V2B stainless alloy lend itself to use in valve discs?

A. Yes. V2B's corrosion and erosion resistance, plus its non-galling characteristics, are ideally suited for valve disc applications. Typical Brinell hardness values range from 302, as cast, to 363 when annealed and hardened. V2B contains Mo, Si, Cu, and Be, and is easily machined in the quench-annealed condition (Brinell 269). Corrosion resistance to H_2SO_4 , HCl , H_3PO_4 , and their salts in the hardened condition exceeds that of all other precipitation-hardenable alloys, and even 316-type stainless. Its resistance to highly concentrated hot HNO_3 , however, is less than that of 304 and 316.

Q. In open-shut operations, which type gate valve is preferable: wedge type, or parallel-faced disc type?

A. This depends on many variables such as system pressure, temperature, and differential pressure across the disc. With low system pressures and temperatures, the wedge type is preferred for positive shutoff. With high temperature-pressure systems, however, since shutoff tightness is directly affected by pressure drop across the disc, the parallel-faced disc type is preferable, especially in regard to required stem torque and disc binding.



Thermon fills voids between body and tubing, providing continuous heat-flow path between heating element and valve body. It can be easily removed for repair of leakage in tracers

We've Cut Jacketed Valve Cost By 75%

Standard Cooper Alloy stainless steel valve models with low-cost Thermon* jacket are designed for use in hot or cold service

Thermon, a non-metallic plastic compound with highly efficient heat-transfer properties when factory-applied to standard Cooper Alloy stainless steel valves with conventional steam traced or thermal electric systems, permits all the performance advantages and none of the problems generally associated with jacketed units. You can even use standard piping without juggling sizes, and product contamination, usually a big problem with most jacketed units, is not possible, because we have eliminated the need for complicated castings which are subject to hidden defects.

What's more, the costs are one-quarter of what you would expect to pay for jacketed valves. Thoroughly tested under all operating conditions, Cooper Alloy Thermonized valves have the high performance characteristics equal to the most efficient jacketed

units, in operating temperature ranges from below zero up to 750°F.

Cooper Alloy Thermonized valves make maintenance problems easy. Should tracer leaks develop, they can be quickly found and repaired. With a minimum of down time required, your processing operation can be continued without a great loss of productive hours and manpower.

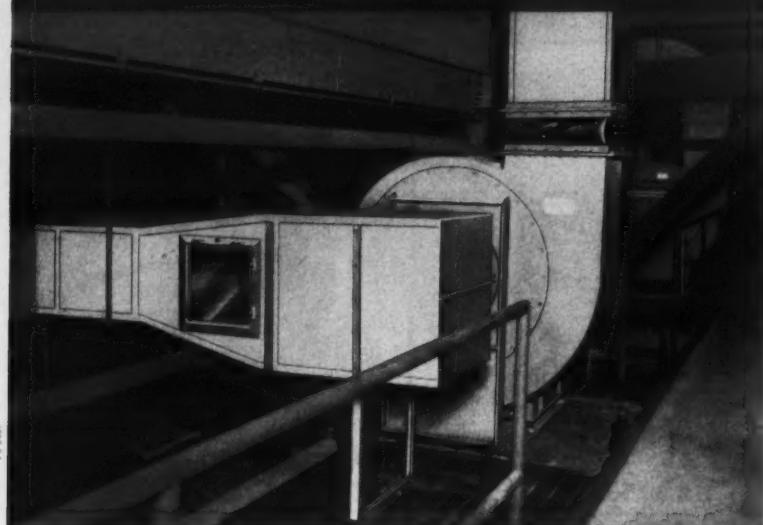
With Cooper Alloy Thermonized valves you get all the high quality features you expect in a Cooper Alloy product. You get high-performance, lower-cost jacketed valves, and you can get practically off-the-shelf delivery to meet your production needs. For further details, request engineering data folder from Cooper Alloy Corp., Hillside, N. J.

*Thermon is a product of the Thermon Mfg. Co., Houston, Texas.

Check 4318 opposite last page

problem: Corrosive Acid Fumes

solution: Van-Cor Exhaust Duct System

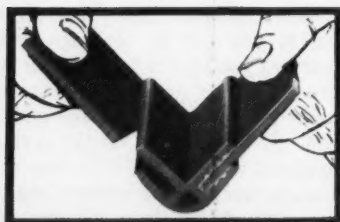


OVER 50,000 SQ. FT. OF VAN-COR SHEET AND JOINING STRIPS remove all acid, plating and cleaning fumes throughout the Allentown (Pa.) Works of Western Electric Co. Corrosion is stopped in its tracks because Van-Cor unplasticized PVC is resistant to scores of acids, alkalis and salts.

Although the contractor was unfamiliar with plastics fabrication, he was able to assemble the components of this system on the job site at a substantial savings over installation of prefabricated components. This savings was made possible through the use of Van-Cor joining strips.

VAN-COR FABRICATIONS, PIPE, FITTINGS, VALVES, CONDUITS offer you these advantages:

1. Resist Corrosion of Industrial Acids & Alkalies
2. Light in Weight ($\frac{1}{2}$ that of Aluminum)
3. Easily Installed; High Tensile Strength; Low Flow Resistance
4. Readily Formed, Machined, Threaded and Welded



Van-Cor 90° and H Joining Strips
The fast, low-cost way
to connect PVC sheet stock.

*Write for Catalog and Name
of Nearest Distributor*

INDUSTRIAL DIVISION OF...
COLONIAL PLASTICS MFG. CO.
Subsidiary of THE VAN DORN IRON WORKS CO.
2685 EAST 79TH STREET CLEVELAND 4, OHIO

Check 4319 opposite last page

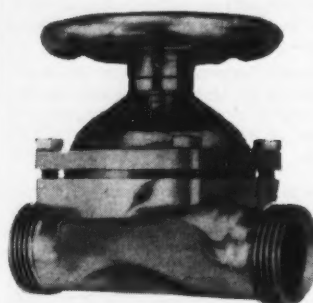
CORROSION CONTROL

Corrosion-resistant valves give good product flow with minimum agitation

Uses: Units are suitable for applications in chemical, brewery, and food industries.

Features: Valves are corrosion-resistant and leakproof. Design permits maximum product flow with minimum agitation — at temperatures of 210°F and pressures up to 150 psi.

Description: Lightweight diaphragm valve is available in 1, 1½, and 2" OD tube sizes with either sanitary threaded



Diaphragm valve is corrosion-resistant—permits maximum product flow

ends or "Tri-Clamp" ends. All contact parts of valve are manufactured from Type 316 stainless steel. Replaceable, neoprene diaphragm is entirely separate and easy to clean.

(Diaphragm valve is product of Tri-Clover Div., Ladish Co., Kenosha, Wis.)

Check 4320 opposite last page.

Rope resistant to acids, chemicals and solvents made from Saran

A man-made rope reportedly resistant to water, chemicals, solvents, acids, and common alkalis is now being offered to the chemical processing industry.

Manufactured from Saran, which is made from petroleum and brine, rope is said by manufacturer to have characteristics wholly its own. Its usage is limited to operations where chemical action greatly shortens life of fiber rope.

engineered and designed
by **INFILCO** to meet
most efficiently your
liquid mixing
requirements...

VORTI® **MIXERS** **FOR FLUID AGITATION**



The "VORTI" Mixer by INFILCO achieves the most practical design for the widest range of fluid mixing and blending operations. It is a proven agitator which uses relatively large radial-flow impellers operating at low speeds. Operation is economical and requires minimum maintenance. Hydraulically, the "VORTI" Mixer is a highly efficient, turbine-type rotor, universally applicable to all problems of agitation and mixing for batch or continuous operation.



Write for
"VORTI" Mixer Bulletin 730.



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Dept. I.S. P.O. Box 5033 ARIZONA

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CHEMICAL PROCESSING

CORROSION CONTROL

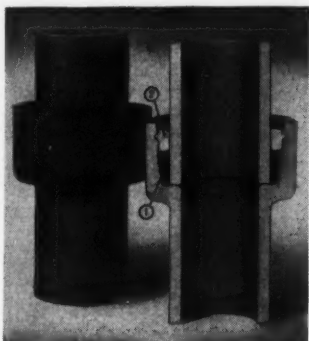
Manufacturer reports rope is non-water absorbent and non-flammable when exposed to high temperatures. The firm further maintains the rope has great resistance to abrasion, will wear long and is, from all indications, unaffected by age or weather.

(Saran rope is manufactured by Columbian Rope Company, 3180 Genesee St., Auburn, New York.)

Check 4322 opposite last page.

Bell and spigot joint repels corrosive attacks

Recently developed bell and spigot joint for stoneware provides seal which cannot be broken by corrosives or heat.



Bell and spigot joint cutaway. (Numbers are referenced in story)

Three rings of acid-proof rope (1) are caulked tightly between bell and spigot.

About $\frac{3}{4}$ " of lead wool (2) is caulked on top of rope to hold it firmly in place. Joint does not require melting pots, flame, or heat.

(Further information about bell and spigot joints used in Knight-Ware pipe and fittings may be obtained from Maurice A. Knight Co., Akron 9, Ohio.)

Check 4323 opposite last page.

Heat-resistant paint application data is contained in four-page Brochure V-89 — Paint Sales Division, The Joseph Dixon Crucible Company, Jersey City 3, N. J.

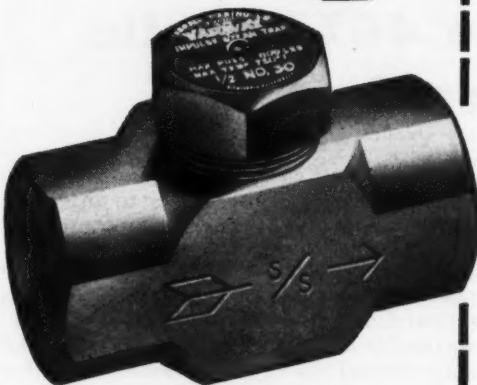
Check 4324 opposite last page.

THE YARWAY FAMILY OF FINE STEAM TRAPS



SERIES 60—normal needs, pressures to 400 psi, 6 sizes. SERIES 120—normal needs, pressures to 600 psi, 6 sizes. SERIES 40—for extra heavy loads, 5 sizes. NO. 30—for extra light loads ($\frac{1}{2}$ " only). INTEGRAL STRAINER—highest pressures and marine use, 6 sizes.

NEW NO. 30 IS A LIGHT LOAD SPECIALIST



When the condensate load in your steam lines is *extra light*—this new Yarway $\frac{1}{2}$ " No. 30 Steam Trap is *exactly right*.

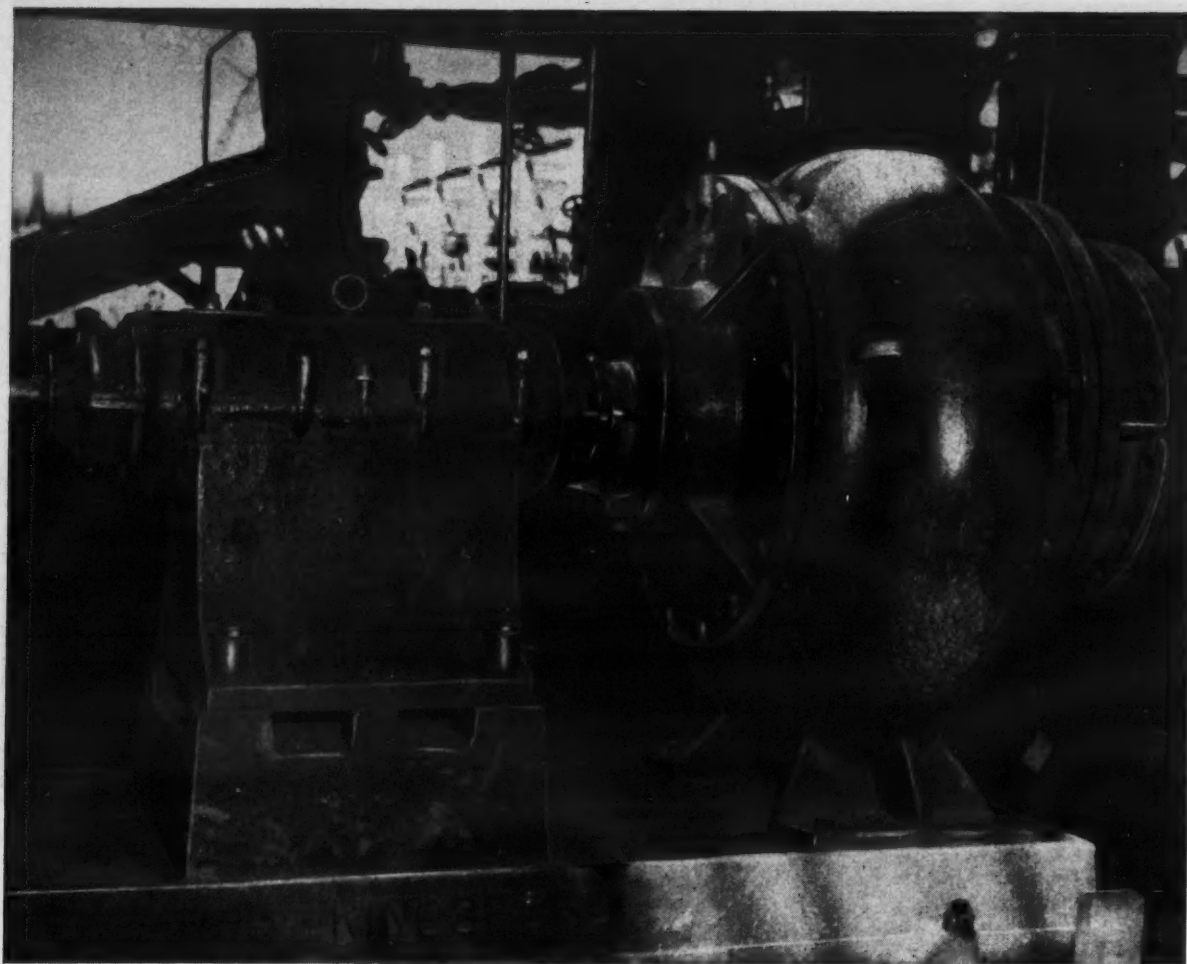
Specify it. You'll experience new *economy of operation* with the *tighter shut-off*. Operation is *quieter* due to lever action. *Maintenance is less*—because of the replaceable valve-seat assembly, only one moving part and stainless steel construction. Enjoy these special features plus all the regular advantages of famous Yarway Impulse Traps such as *quick heating*, even temperatures, small size, good for all pressures, non-freezing.

Over 1,250,000 Yarway Impulse Traps already sold; buy yours from one of 270 local Industrial Distributors.

YARNALL-WARING COMPANY
125 Mermaid Ave., Philadelphia 18, Pa.

YARWAY impulse steam traps

Check 4325 opposite last page



ONE OF TRIPLETS. Three pumps with Inco-cast Nickel housings push cell liquor through heat exchangers within triple-effect evaporators at

a new caustic-chlorine plant. Inco-cast Nickel provides high resistance to caustic embrittlement...brine corrosion...abrasion from solids.

How would you handle 46% caustic, 12% salt slurry?

This pump circulates cell liquor and caustic soda through heat exchangers in triple-effect evaporators.

Caustic concentrations run as high as 46% . . . salt slurry concentrations up to 12%.

Nickel was specified for the housings because it resists attack from brine corrosion, caustic embrittlement, and abrasion from solids.

But these excellent properties are of little value unless they are incorporated in high quality castings. That's why Kingsford, the pump fabricator, comes to Inco's own foundry for Nickel housings.

To get the most out of Nickel and high nickel alloy castings, have them Inco-Cast. This is the best

way to make sure your castings will have all of the properties that make Nickel superior to any other commercially available metal for handling caustics.

So, when you're up against destructive service conditions, be sure to investigate the advantages of Inco-cast Nickel and other Inco-cast Alloys. You'll find some good, usable information in our Data Folder, *Engineering Properties of Cast Nickel*. Write for a copy.

THE INTERNATIONAL NICKEL COMPANY, INC.

Bayonne Works

15 Oak Street

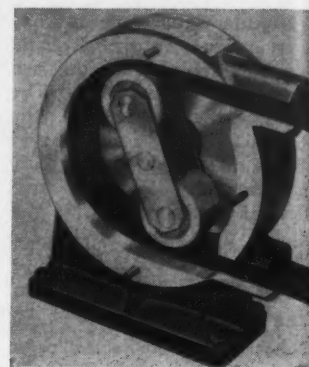


Bayonne, N. J.

INCO-CAST PRODUCTS

Check 4326 opposite last page

CORROSION CONTROL



Corrosive liquids contact only flexible tubes in simple pump

Pump design eliminates corrosion problems by isolating solution within single flexible tube. Fluid is forced through by kneading or squeegee action of ball-bearing rollers working within case.

(Squee-Gee pump is a product of Randolph Company, 1018 Rosine St., Houston, Texas.)

Check 4327 opposite last page.

TI tubing liberated from straight and narrow path

Titanium tubing can now be bent sharply without damage. Technique permits bending of tubing, up to 90°, to a radius as small as tube diameter. It is bent by drawing around rotating bending form. Tube is held in position under pressure and supported by means of special moving clamps, dies, and mandrels. This method minimizes wrinkling of tubing.

(Grade A-40 titanium tubing, suitable for bending sharply, is a product of Superior Tube Company, Norristown, Pa.)

Check 4328 opposite last page.

Fume ducts and other corrosion-resistant plastic equipment made from various polyester and epoxy resins are illustrated and described in eight-page bulletin, "Corrosion Resistant Equipment" — Corite Products Inc., 6553 W. George St., Chicago 34, Ill.

Check 4329 opposite last page.

Designed for long service life, while boasting low material, installation, and maintenance costs . . .

Lead-constructed Scrubber Makes Debut

BETTER dust recovery efficiencies and lower scrubber installation and maintenance costs are being realized through use of recently developed lead-constructed scrubbers at The Consolidated Mining and Smelting Company of Canada Limited. Initially designed and constructed by Cominco, the company has over 50 of the units in use. More than 20 of these are of lead construction, handling a wide variety of corrosive gases and solutions in the company's metallurgical plants.

Known as the Doyle scrubber, the device operates on principles of wet-impingement collection at relatively high gas velocities (150 fps). Dust recovery efficiency is well over 90 percent. Units are currently being made available to the chemical industry through licensed manufacturers both in the U.S. and Canada. This article refers particularly to lead as a material

of construction, but other materials such as mild steel, stainless steel, and wood are also used.

Cage Construction Used

Scrubbers feature lead-on-steel-cage construction. This eliminates unwieldy steel sheets and results in lower material, erection, and maintenance costs. Where chamber design calls for extra support for the lead lining, this can be provided externally, by-passing need for internal strapping or piercing the lead sheets.

The excellent corrosion resistance of lead allows the units to be used in wide variety of applications. If a leak should occur, the cage construction permits immediate location of the leak and easy accessibility for repair. All repairs can be made from outside.

In conventional lead-lined equipment, it is usually customary to provide "weep

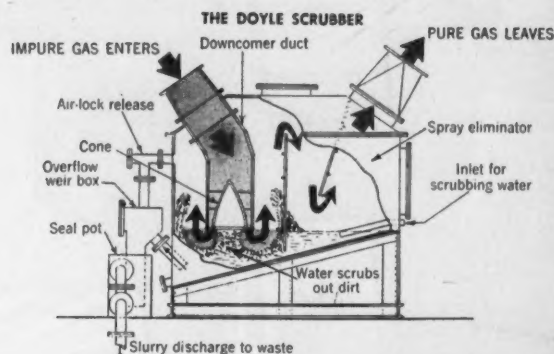
holes" to indicate development of leaks. However, corrosives do not always follow a detectable path from point of failure to the weep hole and observed leaks are often merely an indication of their occurrence rather than of location.

How Scrubber Works

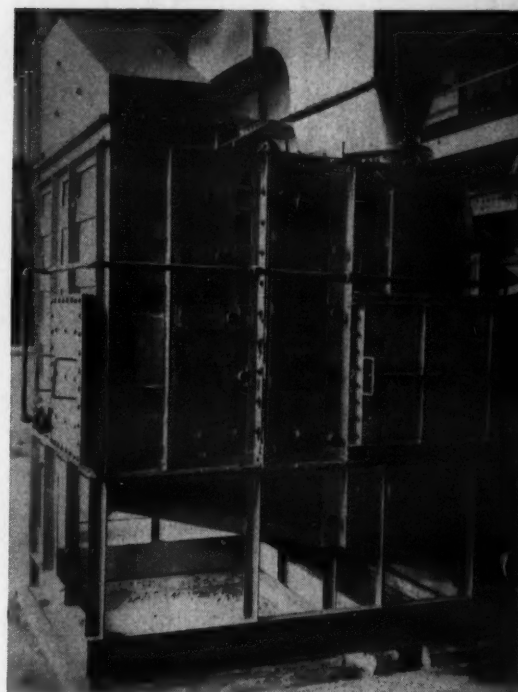
As shown in the accompanying sketch, the gas stream, laden with fume and dust, enters downcomer duct. Gas velocity is increased by annular gap provided by placement of stream-lined cone at bottom of duct. Desired impingement velocities are obtained by use of cones of appropriate base diameters. An adjustable cone can be installed if wide variations in gas volume are expected.

Passing into scrubbing liquid at bottom of unit, the impure gas changes its direction of flow, leaving impingement section. It then enters spray elimination section. Cleaned gas is exhausted through exit at top. Aqueous scrubbing liquid, containing waste or recoverable solid components, leaves unit at bottom, ready for reprocessing or dumping into waste storage area. Clarified liquid may be returned to scrubbing system for reuse.

(Further information about the Doyle scrubber and names of equipment fabricators authorized to manufacture them may be obtained from Patent Department, The Consolidated



Cone at bottom of downcomer duct regulates gas impingement velocity as it enters aqueous scrubbing solution



Typical lead-constructed scrubber has over 4900 lb of antimonial lead sheet. Sections, ranging in weight from 24 lb at bottom, to 8 lb on sides of unit above water line are used

Operating Conditions for Lead-constructed Scrubber

Power, hp per 1000 cfm gas	2.2 to 3.0
Scrubbing liquid, gal water per 1000 cfm gas	2*
Impingement velocities, ft per sec	90 to 240
Inlet gas volume, cfm at 30°C	6000
Inlet dust burden, mg per cu ft	140 to 180
Outlet dust burden, mg per cu ft	0.1
Draft across scrubber, inches w.g.	10

* In some applications, rate is as low as 0.5 gal/1000 cu ft of gas

Mining and Smelting Company of Canada Limited, Trail, British Columbia, Canada.)

Check 4330 opposite last page.

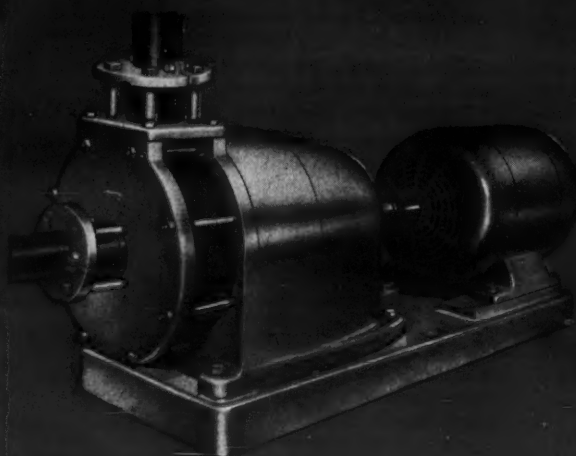
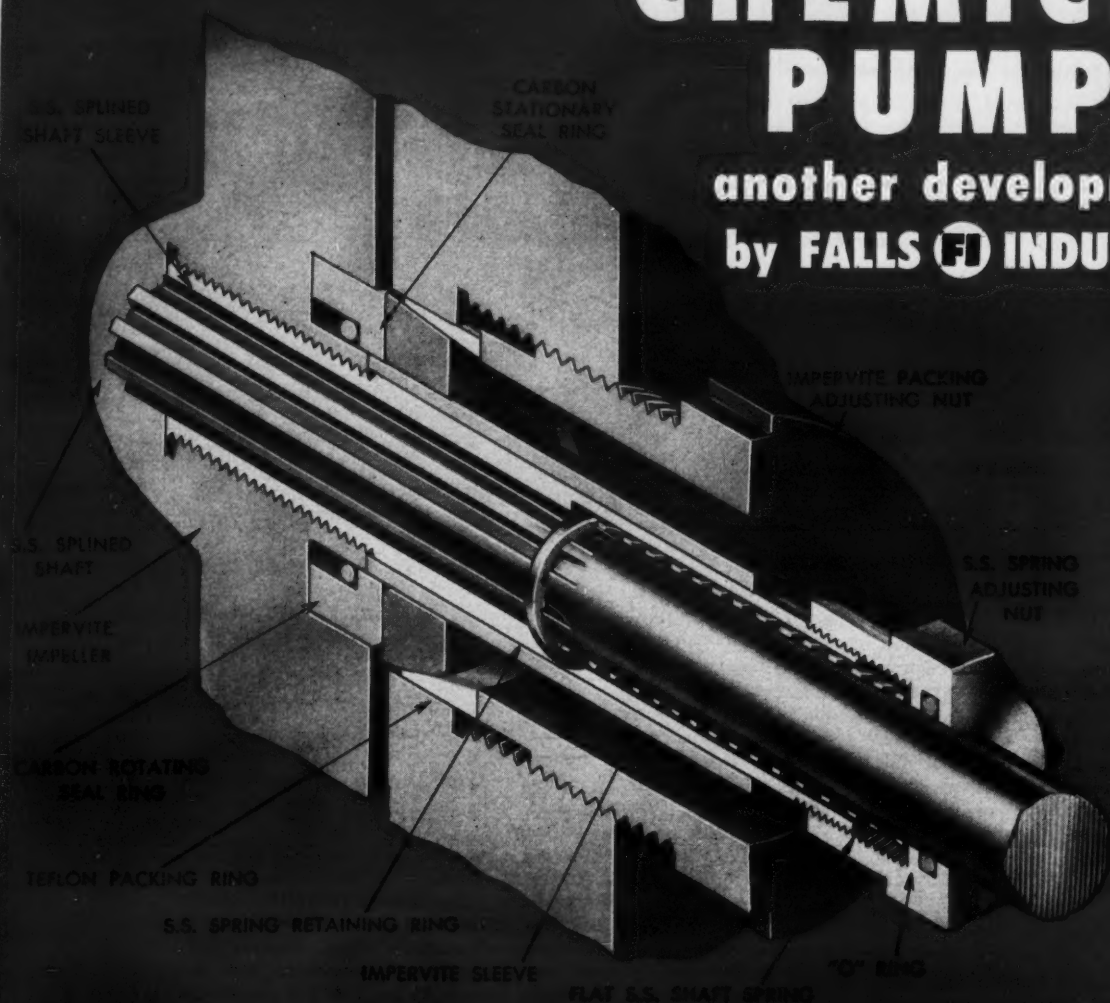
(Additional data on use of lead in chemical processing equipment is available from Lead Industries Association, 60 E. 42nd St., N. Y. 17, N. Y.)

Check 4331 opposite last page.

... the almost perfect

CHEMICAL PUMP


another development
by FALLS  INDUSTRIES



The secret is in the seal... a self-cooling, self-lubricating carbon-to-carbon rotary seal capable of withstanding temperatures in the 500°F. range. This seal requires no special lubrication, or externally located cooling apparatus which might be contaminated by product leakage. Seal is virtually leak-proof when kept in normal adjustment, and is not attacked by most corrosives.

One user says, "Pump operating continuously for 6 months on 75°C. chlorinated organic acid. Best service ever; no maintenance yet." Another states, "During 3 months, total labor and maintenance has been \$23.00 for 14 Impervite pumps handling hot mixtures of phenol, chlorobenzene, benzene and hot muriatic."

... and Impervite pumps are surprisingly low in cost.

FALLS  INDUSTRIES, INC.

AURORA ROAD • SOLON, OHIO

Phone: CHurchill 8-4343

Teletype No. Solon 0-77

Impervite pumps are single stage centrifugals, available in 6 standard models from 25 to 300 gpm at 20 to 100 foot heads. Corrosives come into contact only with Impervite impervious graphite, which is unaffected by all corrosives except a few highly oxidizing agents, is immune to thermal shock, and non-contaminating. Bulletin available on request.

SEE OUR CATALOG IN C.E.C.

TUBE AND SHELL EXCHANGERS incorporating latest design and standards... Bull. 448.

HCl ABSORBERS

HCl ABSORBERS and TOWERS including all standard types of towers as well as falling film type HCl absorbers... Bull. 505.

CROSS-BORE EXCHANGERS accommodate pressures to 200 psi at temperatures to 400°F... Bull. 560.

PIPE, FITTINGS AND VALVES... Bull. 965-1.

RUPTURE DISKS made of impervious graphite display some truly amazing properties which save money for processors... Bull. 315.

FIELD SERVICE provides trained men for installation, relocation or repair of any impervious graphite equipment... Bull. 24.

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COSTS AND STANDARDS of impervious graphite processing equipment... Bull. 249.

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FALLS INDUSTRIES, INC.
11909 Aurora Rd., Solon, Ohio

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| <input type="checkbox"/> Bulletin No. 182 | |

NAME

TITLE

COMPANY

ADDRESS

CITY ZONE STATE

PROCESSING EQUIPMENT

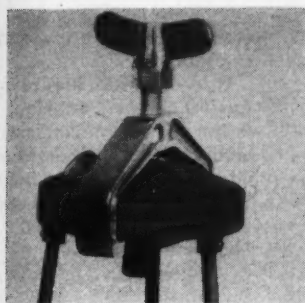
Compact membrane filter produces 25 to 100 gph ultra-pure water

Removes particulate matter down to 0.45 micron

Uses: Filter is primarily designed for use with distilled or demineralized water. Unit removes particulate matter down to 0.45 micron.

Features: Rate of flow is 25 to 100 gal per hour. Total height of filter is only 20 inches, excluding legs.

Description: Filter media used is Millipore cellulose ester membrane. Standard units



Filter has cellulose ester membrane filter media

are bronze-lined with pure block tin on exterior surfaces. Filter can also be furnished with Teflon or Kel-F interior coating. In addition, inner surfaces may be nickel coated or entire unit may be made of stainless steel or aluminum.

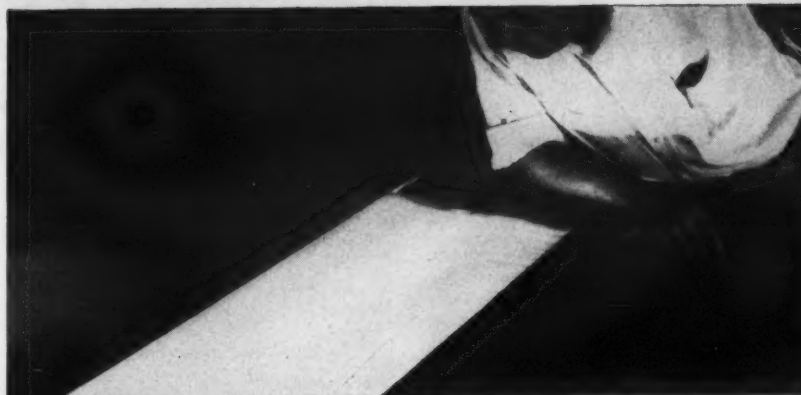
(Model MF-25 submicron filters are product of The Barnstead Still & Sterilizer Company, Lanesville Terrace, Boston 31, Massachusetts.)

Check 4332 opposite last page.

Vacuum furnace is subject of 2-page bulletin. Specifications and operating requirements of the 12-lb unit are also listed in "Vacuum Induction Furnace" — NRC Equipment Corp., National Research Corp., 160 Charlemont St., Newton Highlands 61, Mass.

Check 4333 opposite last page.

For more information on product at left, specify 4334 . . . see information request blank opposite last page.



Who makes and meets your Wire Cloth Specs?

CAMBRIDGE does . . .

To assure you of wire cloth fabrications that give long and satisfactory performance, we have experienced engineers who can draw up prints for your approval if necessary, and trained production men who can quickly and accurately fabricate parts to your most rigid specifications.

To fill your most diversified bulk wire cloth needs, we have thousands of items in stock—in all meshes, wire sizes, metals or alloys—ready for prompt delivery.

Modern machinery, careful workmanship and constant inspection assure you of exact mesh count and mesh size. And, our field engineers follow up your order to see that our product is giving the best possible service.

We make wire cloth from any metal or alloy—including titanium—in nine basic weaves—from finest to coarsest mesh. Call your Cambridge Field Engineer for information. He's listed in the yellow pages under "Wire Cloth". Or, write for FREE 94-PAGE CATALOG.



The Cambridge Wire Cloth Co.

Department F • Cambridge 3, Md.

Manufacturers of Wire Cloth,

Metal-Mesh Conveyor Belts, Wire Cloth Fabrications

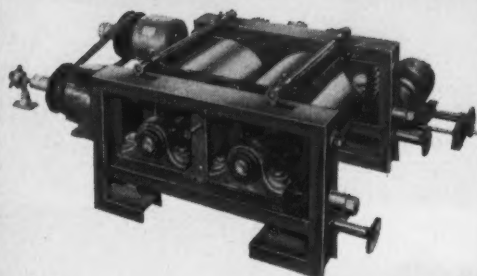


Check 4335 opposite last page



LABORATORY FACILITIES

Available to serve You!

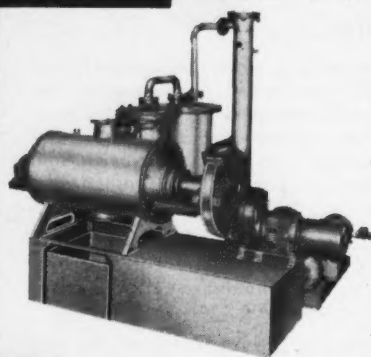


DRUM DRYERS

For rapid and continuous conversion of liquids and slurries to dry solids. G-B atmospheric drum dryers provide an economical and practical means of drying many chemicals.

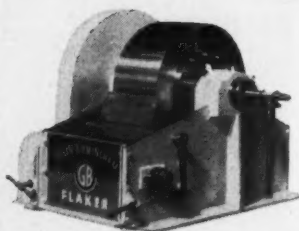
VACUUM ROTARY DRYERS

For heat sensitive products and recovery of solvents. G-B vacuum rotary dryers used for removal of moisture from centrifuged or filtered solids at low temperature levels.



FLAKERS

For rapid and continuous conversion of molten products to solid flakes. Fully enclosed or open types may be used advantageously to produce many products in a flake form.



These pilot scale units, available in our laboratory, provide the means to investigate your process equipment problems and demonstrate performance. Consult G-B for assurance of proper equipment selection.



GOSLIN-BIRMINGHAM
MANUFACTURING CO., INC.
BIRMINGHAM, ALABAMA

FILTERS • EVAPORATORS
PROCESS EQUIPMENT
CONTRACT MANUFACTURING
including HEAVY CASTINGS

Check 4336 opposite last page

PROCESSING EQUIPMENT

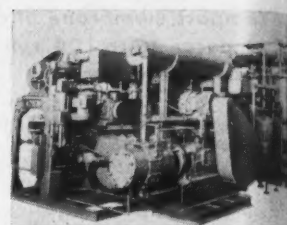
**Generates 99.99% pure N₂
at rate of 10,000 cfh
by dry process**

Gas costs about 18-22 cents
per 1000 cu ft

Uses: Producing up to 10,000 cfh 99.99% pure nitrogen at pressures up to 100 psi. Product is suitable for any application where a high nitrogen, CO₂-free, dry atmosphere is needed in chemical, food, metal, or allied industries.

Features: Generator produces nitrogen at a cost between 18-22 cents per 1000 cu ft, by a dry, completely automatic process. Only moving parts in unit are gas-mixing machine, blowers, and motorized valves. Synthetic zeolite "molecular sieves" are used as absorbents.

Description: Generator consists essentially of the follow-

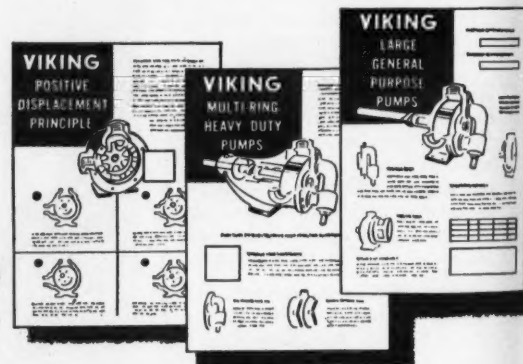


Nitrogen generator operates fully automatic, uses molecular sieves to absorb CO₂, SO₂, H₂O, water vapor, and traces of nitrogen oxides

ing basic components: 1) combustion assembly, 2) positive displacement blower and gas-to-air heat exchanger, 3) positive displacement gas booster and water-to-gas heat exchanger, and 4) absorption assembly.

Hydrocarbon fuel (natural gas, methane, propane, etc.) is burned in the catalyst-filled combustion chamber to obtain complete reaction without unburned methane, high residual

PUMPS ON YOUR MIND?



Send for this VIKING Pump Data

**VIKING
ENGINEERING DATA**

A 36-page pump engineering manual is yours for the asking. It fully explains the 10 easy steps in selecting Viking rotary pumps. Ask for catalog KCC.

**VIKING
HEAVY DUTY PUMPS**

Available in 10 to 1050 G.P.M. sizes, these rugged Vikings are suitable for pressures up to 200 PSI. Complete with specifications, performance data, etc., they are illustrated in the 24-page catalog CCC.

**VIKING
GENERAL PURPOSE PUMPS**

These Viking Pumps — in 2/3 to 1050 G.P.M. sizes — are suitable for pressures up to 100 PSI. They are fully illustrated and have specifications, performance data, etc., in the 36-page catalog BCC.

All Viking Pumps are positive displacement pumps and deliver either thin or thick liquids.

VIKING — the leader,
not a follower,
in Rotary Pumps



VIKING PUMP COMPANY

Cedar Falls, Iowa, U.S.A. In Canada, it's "ROTO-KING" pumps

See Our Unit in Chemical Engineering Catalog

Check 4337 opposite last page

CHEMICAL PROCESSING

PROCESSING EQUIPMENT

oxygen, or high percentages of oxides of nitrogen.

The CO₂, water vapor, SO₂, or H₂S, and traces of nitrogen oxides are removed by the molecular sieve absorbent. Once generator is started, operation is completely automatic and continuous.

Generator can be operated to produce following percentage analysis:

	From	To
	Inert	ing
Oxygen	0.00	0.00
Carbon dioxide	0.01	0.05
Hydrocarbons	0.00	0.5
		max.
Water vapor	less than	
	-80°F	
	dewpoint	
Hydrogen	0.00	13.0
Carbon Monoxide	0.00	11.0
Sulfur	0.00	0.00
Oxides of		
Nitrogen	0.00	0.00
Nitrogen with		
traces of argon	Balance	

Generators are available in eight sizes, ranging in capacity from 1000 to 10,000 cfm. Smallest unit weighs 16,000 lb, occupies floor space 10½ x 10 x 8 ft high. Biggest weighs 35,000 lb, occupies 24 x 15 x 11 feet.

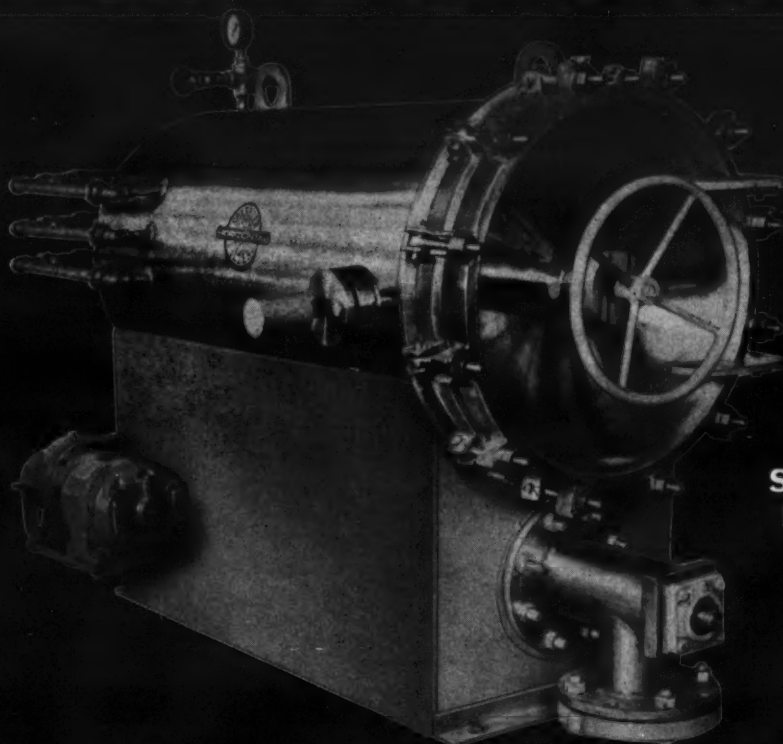
(HYNI generators are product of Lindberg Engineering Company, 2450 West Hubbard Street, Chicago 12, Ill.)

Check 4338 opposite last page.



"A favorite prank with him—it's lubricating oil, really!"

ANOTHER SPARKLER FIRST



**SPARKLER
Model HR**

(Patent Pending)

A REVOLUTIONARY NEW FILTER

NOW-HORIZONTAL PLATE CAKE STABILITY PLUS DRY CAKE DISCHARGE. -ALL AUTOMATIC-

This filter has all the operating features filtration engineers have dreamed of for years—Write for details.

**SPARKLER
FILTERS**

**SPARKLER MANUFACTURING CO.
MUNDELEIN, ILLINOIS U. S. A.**

Sparkler International Ltd., Manufacturing Plants at Leliegat 9,
Amsterdam, Holland; Toronto, Ontario, Canada; Italy and Australia.

FILTRATION ENGINEERING AND MANUFACTURING EXCLUSIVELY FOR OVER 30 YEARS

Check 4339 opposite last page

ACCO
for Better
Values

THE COMPLETE LINE—

R-P&C VALVES

DESIGNED FOR DEPENDABILITY



This new FORGED STEEL GLOBE VALVE offers maximum strength and safety...longer life!

• R-P&C's new F80 Forged Steel Globe Valve is a versatile, precision-built addition to a distinguished valve family. Designed and engineered in cooperation with many of the country's leading engineers of the power, process piping and shipbuilding industries, the F80 Globe Valve is manufactured to the most rigid standards to overcome the problems of ever-increasing temperatures, pressures and corrosion.

Here are a few of its many features that insure greater strength and safety, longer service life and lower maintenance cost: Forged Steel body, bonnet and gland... "375 Brinell" stem with rolled stem threads... "500 Brinell" disc-lapped seat face... molded, reinforced asbestos

packing. Test Pressures: Hydrostatic Shell test, 2500 P.S.I.... Seat Test (air under water), 100 P.S.I.... Pneumatic Testing at 300 P.S.I. when specified. For details, write for Folder DH-213.

R-P&C offers a Complete Line

• Look to your R-P&C Distributor for R-P&C gate, globe, angle and check valves—in bronze, electric iron, cast or forged steel—in a wide range of styles, sizes and pressure classes. In addition, R-P&C offers a full line of cast steel fittings, also specialties such as asbestos-packed cocks, bar stock valves, Lubrotite gate valves and other items. For complete R-P&C catalog, write our Reading office.

R-P&C VALVE DIVISION AMERICAN CHAIN & CABLE

Reading, Pa., Atlanta, Boston, Chicago, Denver, Detroit, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.



BAR STOCK
VALVE

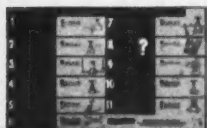


BRONZE
GATE
VALVE



IRON
GLOBE
VALVE

ACCO



FREE WALL CHART "How to Protect Your Valves"

Installation pointers, operating tips, clues to longer valve life. They are all on this 22" x 17" wall chart. Write for your free copy.

PROCESSING EQUIPMENT

Electronic computer yields design data, quotations for heat exchangers

Electronic computing system reduces heat exchanger design and estimate time from one or two hours to minutes. Data sheets, specially prepared for computer, are filled out by interested customer and sent in for analysis.

Necessary data are stored in memory locations on computer magnetic drum. Computer is programmed to find input data and to perform proper mathematical operations. Answers are produced in typewritten form.

(Heat exchanger design and estimating technique is used by Brown Fintube Company, 504 Huron St., Elyria, Ohio.)

Check 4341 opposite last page.

Gravitational classifier utilizes three forces for separating fines

Uses: Separating dry fines from coarse materials.

Features: Classifier has no moving parts. Power consumption is low because most of the energy required is only for overcoming draft losses ranging from 0.5 to 4" WG. Fines are separated by gravity, drag, and centrifugal forces.

Description: Unit receives feed material at the top. Low velocity air is blown through it at right angles as material flows downward. Air stream turns sharply upward, and passes between widely spaced vanes as it enters outlet duct.

Particles smaller than a given size are carried through outlet. Larger particles are dashed against vanes and are thrown back into feed curtain. If large enough, particles are unaffected by air stream and continue downward.

"Cut point" is controlled by regulating air velocity. This varies magnitude of drag and centrifugal forces and will alter resultant aerodynamic force on each particle.

By regulating this force, particles smaller than selected size will be collected with fines, and larger particles will be

Check 4340 opposite last page

PROCESSING EQUIPMENT

collected with the coarse. A very small percentage of particles having exact size as the cut point designation may be collected with either the fines or the coarse.

Manufacturer recommends classifier for applications where cut point is between 50 and 100 mesh (297 to 1651 microns).

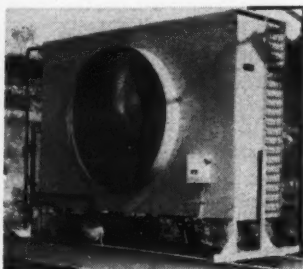
(Gravitational Classifier is development of Buell Engineering Company, Inc., 123 William St., New York, N.Y.)

Check 4342 opposite last page.

Air-cooled condensers have bigger capacity, cost less

Only simplified piping needed to connect multiple units

Manufacturer's line of air-cooled condensers has been expanded to include ten new models providing capacities of 30 through 100 tons. Used for variety of cooling applications, units feature lower initial



Air-cooled condenser has 30-ton rating, handles condensing requirements for air conditioning system

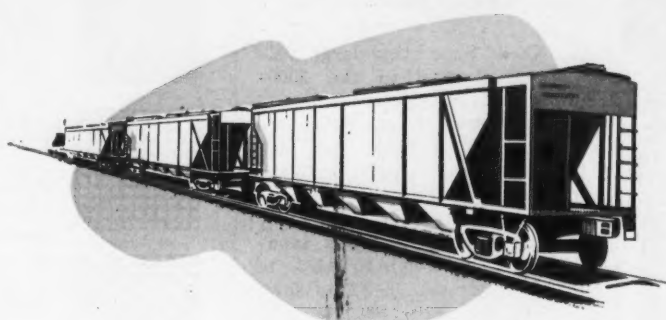
costs, higher capacities, and simplified piping installation, especially when used with multiple condensing units.

Basic units have 30, 35, 40, 45, and 50 ton rating. Condensers are also available as twin units providing 60, 70, 80, 90, and 100 ton capacities. Necessary manifolding is provided for inter-connecting twin units.

(Type-AC air-cooled condensed is product of Halstead & Mitchell, 700 Bessemer Building, Pittsburgh 22, Pa.)

Check 4343 opposite last page.

An Easy Way to Lower Freight Costs



ON YOUR CONCENTRATES

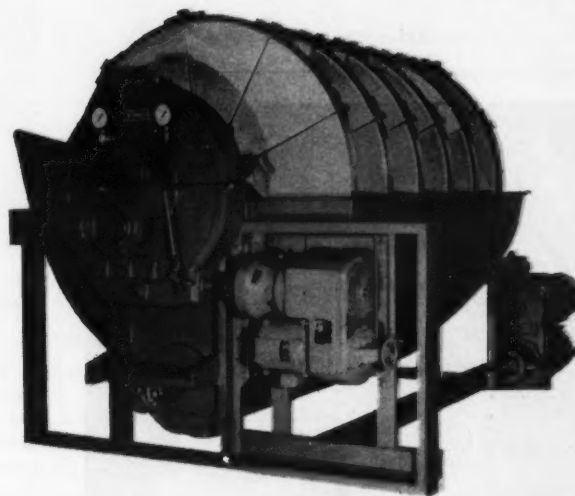
Ship less liquid . . . more concentrate . . . per freight dollar! Say you ship 50 tons of concentrate with a moisture content of 17%, but by a change in your mill you could cut the moisture content to 7%. That would mean 5 tons more concentrate shipped for the same freight cost!

USE THE EIMCO

AGIDISC FILTER

It has helped more operators (names of users on request) save money in shipping concentrates than any other single piece of processing equipment, by reducing moisture content of concentrates to the lowest (by competitive tests) percent of any given material. It does it faster, at less cost and better than any other method.

Want Proof? Get all the details by writing The Eimco Corporation, P. O. Box 300, Salt Lake City 10, Utah.



B-383

THE EIMCO CORPORATION

• SALT LAKE CITY, UTAH

Research and Development Division, Palatine, Illinois

• Process Engineers, Inc. Division, San Mateo, California

Export Offices Eimco Building, 51-52 South Street, New York 5, N. Y.

BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

HIGHEST ACCURACY AT A SENSIBLE COST



NEW

ELECTRONIC PRESSURE SWITCH

for pressure, vacuum, flow, differential pressure, liquid level

New manometer-type electronic pressure switch for alarm signalling and/or control gives extremely sensitive response on even very low ranges... will sense pressure increments as small as 0.003 oz./sq.in.

Consisting of a Meriam Contactor Manometer and a Manotac Electronic Relay Unit, the switch offers D.P.D.T. switching for each manometer contact point. Manotac Relay has convenient modular construction with interchangeable plug-in circuit cards, operates on 110V AC.

Available in a variety of ranges, the switch never requires recalibration, is rugged enough for in-plant service right on the process line.

WRITE FOR BULLETIN A-11

THE MERIAM INSTRUMENT CO.

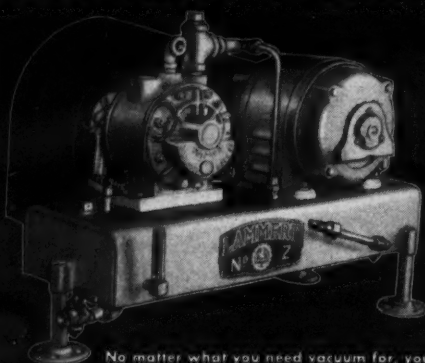
10920 Madison Avenue
Cleveland 2, Ohio



S.A. 1748

Check 4345 opposite last page

VACUUM LAMMERT PUMPS



No matter what you need vacuum for, you will get dependable service from automatically lubricated Lammert pumps. Capacities—4.3 to 225 cubic feet per minute. From medium to high vacuum (up to 20 microns of barometer).

Write for catalog showing the complete line, including specifications, of Lammert pumps and compressors.

LAMMERT & MANN CO., INC.

1753 Walnut Street, Chicago 12, Illinois, SEeley 3-0383

Check 4346 opposite last page

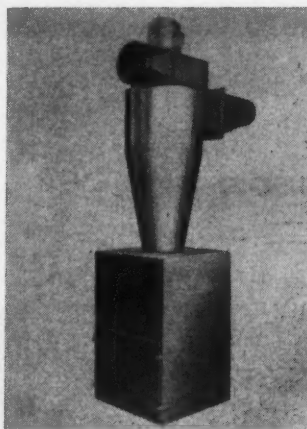
PROCESSING EQUIPMENT

Compact dust collector has high efficiency, can handle 3000 cfm

Uses: Separating large volumes of dust in the 2000-3000 cfm range.

Features: Dust collector's self-cleaning radial fan design provides high performance at low horsepower requirements. In laboratory tests, typical unit has separated (by weight) 99.8% of steel grindings, 99.5% of sawdust, and 84% of fine corn starch particles.

Description: Designated Model No. 24, high-efficiency cyclone separator is designed for outside exhaust. When it



High-efficiency dust collector is operated by 7½ hp motor, can handle from 2000-3000 cfm

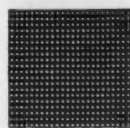
is desired to save heat and recirculate cleaned air, units can be equipped with cloth after-filter bags. Separators are operated by 7½ hp motor. Base contains convenient pull-out drawer with 9-cu ft storage capacity.

In addition to radial fan, other design characteristics include long-tapering cone, high-inlet velocities, and location of fan on clean air side. Latter eliminates possible fan damage from heavy material being separated. Separator has 10" inlet and 12" outlet.

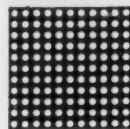
(Additional information about Torit No. 24 cyclone separator may be obtained from Torit Mfg. Co., Walnut and Exchange Sts., St. Paul, Minn.)

Check 4347 opposite last page.

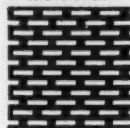
H&K Perforated Screens



.020" Diameter



.045" Diameter



.020" x .125" Slot



Find Nearest H&K Agent in the Yellow Pages

Listed Under "Perforated Metals"

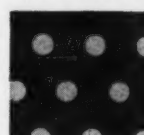
Write for H&K General Catalog

Harrington & King PERFORATING CO. INC.

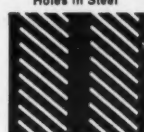
Chicago Office and Warehouse New York Office and Warehouse
5636 Fillmore St., Chicago 44 110 Liberty St., New York, N. Y.

Check 4348 opposite last page

for
Grading
Sieving
Dewatering
Filtering
Straining
Sterilizing
and Tote
Baskets



Tapered Round Holes in Steel



No. 3 Diagonal Slot

H&K perforated screens are furnished, to customer order, with holes accurate and uniform in size, shape and spacing. The screen resists blinding as burr-free holes are slightly larger at the bottom. H&K perforated screens can be furnished with margins or unperforated areas in practically any material desired.

H&K specializes in the perforating of stainless steel, monel and other corrosion-resistant alloys.

Contact either H&K office or an H&K agent. Let us work with you on your perforated screen requirements.



Republic ELECTRUNITE® Stainless Steel Tubing and Pipe... fully Solution Annealed

Here's news for every processor who needs stainless steel tubing and pipe with a dense, lustrous finish on both I.D. and O.D. Republic Steel and Tubes Division's new continuous bright annealing process produces a tube with a hard, high quality finish in sizes from ¼" through 5" O.D. No scale is formed and no etching acid pickling is required. Call your Republic representative, or write for additional information. Send for FREE 60-page brochure STP-1.



REPUBLIC STEEL

STEEL AND TUBES DIVISION
207 East 131st Street • Cleveland 8, Ohio



Check 4349 opposite last page

CHEMICAL PROCESSING

PROCESSING EQUIPMENT

Redesigned salt dissolver has 50% greater capacity, resists corrosion

Uses: Dissolving evaporated salt to produce brine for use in chemical, food, and other industries.

Features: Redesigned salt dissolver permits operation at flow rates 50% higher than that obtained with conventional units. Machine is made of glass-fiber reinforced polyester, resists corrosion, and never needs paint.

Description: Salt dissolver is the outgrowth of basic units having served industry for many years and proven successful under difficult operating conditions. Improved dissolver has greater brine-making capacity than previous models. Because it is translucent, the level of brine salt is visible from any position. Although normally manufactured of reinforced plastic, unit is also available in metal.

Improvements in design are reported to assure continuous trouble-free operation. Optional storage hoppers are custom designed to provide added dry salt storage capacity. Larger sizes than the standard 36" dissolver are available.

(Sterling evaporated salt dissolvers are product of International Salt Co., Inc., Scranton, Pennsylvania.)

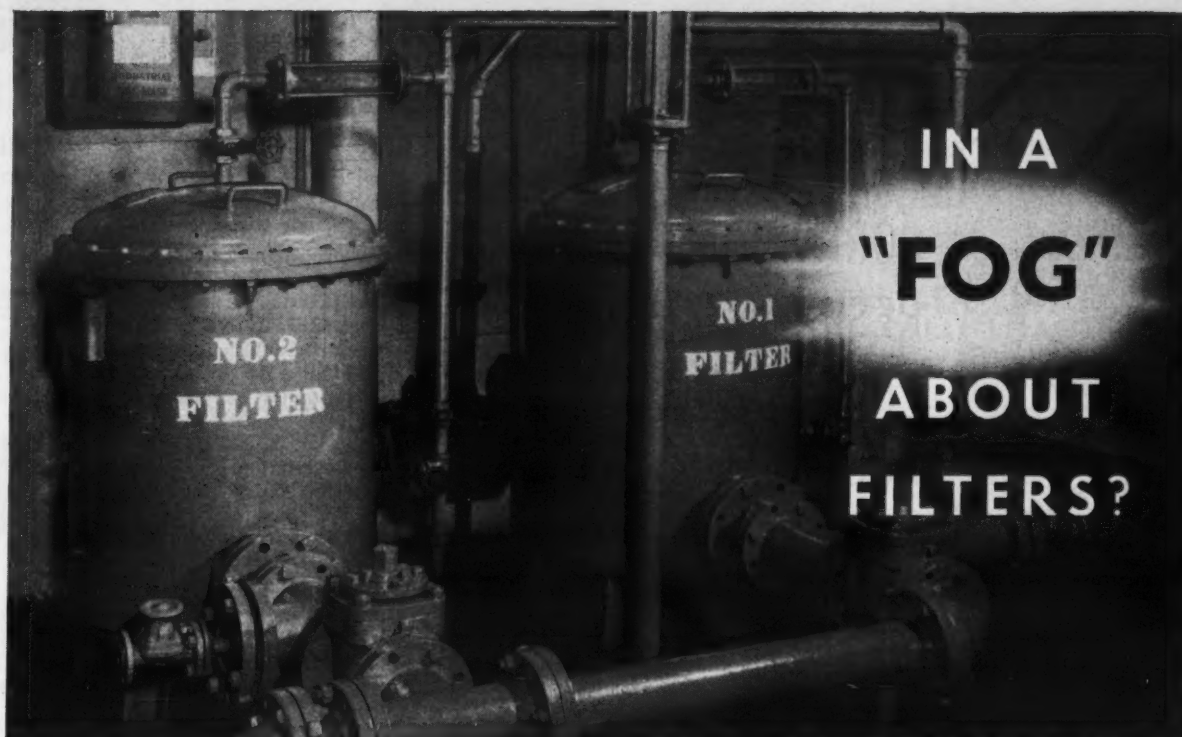
Check 4350 opposite last page.

Continuous reactor which combines continuous mixing with accurate process temperature control is covered in four-page publication which details typical applicable heat transfer calculations. Construction, sizes, and capacities available are described. Laboratory and testing facilities for researching new applications are also discussed in Bul FR-58—Chemical Machinery Division, Baker Perkins Inc., 1000 Hess, Saginaw, Mich.

Check 4351 opposite last page.

Scrubber designed for removing particles less than 5 microns in size is described in 6-page brochure. Specifications and diagrams also appear. Bul HP 955-A—The Johnson-March Corporation, 1724 Chestnut St., Philadelphia 3, Pa.

Check 4352 opposite last page.



IN A
"FOG"
ABOUT
FILTERS?

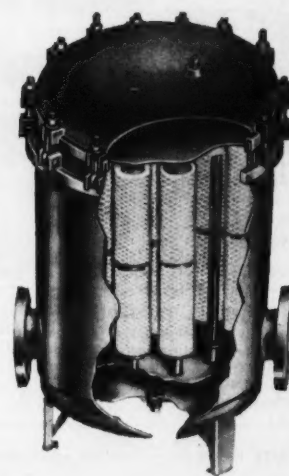
Diamond Alkali Clears Up Paraffin Haze with *Fulflo Filters*

If you're in a fog about filters—or product impurities—take a tip from Diamond Alkali. This leading chemical producer achieves gleaming cleanliness of liquid chlorinated paraffins by a final polishing operation with low-cost Fulflo Filters. Highest quality product standards are maintained.

Diamond's liquid chlorinated paraffins have 30 to 150 poise (Brookfield) viscosity, and are clarified at a flow rate of 200-400 gph. Fulflo Filters are available in a wide range of models for high or low flow rate, viscosity, pressure, pH and temperature. They provide continuous micro-clarity, by true *depth* filtration, for all types of chemicals, oils, water, and other industrial fluids.

Write for technical literature or engineering assistance
to Department CP.

- These two Fulflo Filters, each with
- 110 Honeycomb Filter Tubes, re-
- move micronic particles which
- were causing haze in chlorinated
- paraffin produced by the Chlorin-
- ated Products Division of Diamond
- Alkali Company.



COMMERCIAL FILTERS CORPORATION

MELROSE 76 MASSACHUSETTS

PLANTS IN MELROSE, MASSACHUSETTS AND LEBANON, INDIANA

MICRO-CLARITY AT MINIMUM COST



with genuine Honeycomb Filter
Tubes for controlled micro-
clarity of industrial fluids.

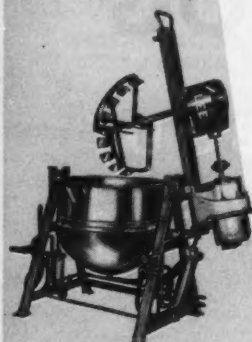


Selective filtration of oils • water-oil
separators • magnetic separators •
pre-coat filters • coolant clarifiers •
automatic tubular conveyors.

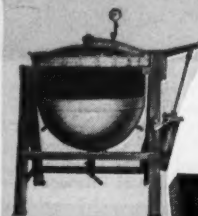
Check 4353 opposite last page



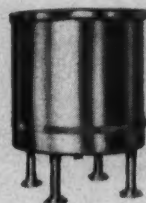
Style A Kettle
¾ Jacketed, 5 to 500 gal.



Style CW3T Kettle
with Center-Line Scraper
Agitator, 80 to 300 gal.



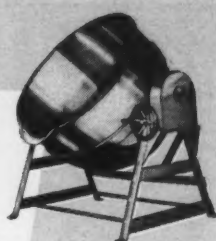
Pressure Kettle
¾ Jacketed,
40 to 200 gal.



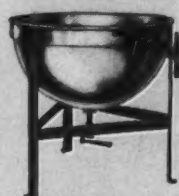
Pulp Tank
500 to 2,000 gal.

IN CORROSION RESISTANT PROCESSING EQUIPMENT

The Name for
Quality is
LEE



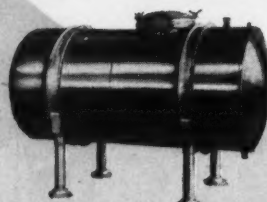
Style CW Kettle
¾ Jacketed,
80 to 300 gal.



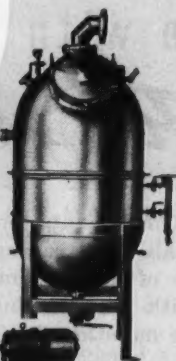
Style B Kettle
Full Jacketed, 10 to 300 gal.



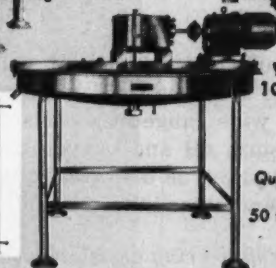
Style C Kettle
¾ Jacketed,
5 to 100 gal.



Storage Tank
100 to
5,000 gal.



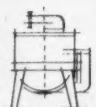
Vacuum Pan
10 to 500 gal.



Quick Cooling
Pan
50 to 200 gal.

SPECIAL DESIGNS

Interested in modifications of standard units or custom-designed equipment? Our facilities are such that we can make any special designed units you may require. Write us.



WRITE for bulletins on any of the products illustrated.

LEE
METAL PRODUCTS
COMPANY, INC.

A.S.M.E.
CODE CONSTRUCTION



Kettles, Plain and Jacketed
Tanks, Processing and Storage
Agitators and Accessories
Vacuum and Pressure Equipment

418 PINE STREET, PHILIPSBURG, PA.

PROCESSING EQUIPMENT

Napping technique makes spun orlon cheaper for filters

Uses: In dust collectors and other dry filtration equipment where high rate of air flow and retention of very small particles are required.

Features: Napping technique enables spun orlon to be sold at a price 1/3 to 1/4 less than that of conventional orlon felt customarily used for dry filters.

Description: Cloth, which withstands temperatures of 250°F, has high strength and abrasion resistance. Manufacturer reports it is unaffected by ordinary solvents, oils, greases, and waxes and is not attacked by strong oxidizing chemicals or mineral acids.

Pressure drop is low. Free air flows through fabric at rate of 40-50 cfm/sq ft at 1/2" water pressure.

(Techfab 5182E is development of Technical Fabricators, Inc., 136 Washington Ave., Nutley, New Jersey.)

Check 4355 opposite last page.

Dry or semi-dry materials mixed fast, efficient with ribbon blender

Designed to prevent contamination from batch to batch

Uses: Mixing either dry or semi-dry materials.

Features: Sanitary blender is especially designed to prevent contamination from batch to batch. Machine performs quick mixing operations with peak efficiency.

Description: Ribbon blenders in nine sizes ranging in capacities from 16 to 300 cu ft. Construction is either stainless or carbon steel. Heating or cooling jackets and internal weldment finishes are available if desired.

Tub ends are rounded with 1" radius to prevent material from hanging in corners. Discharge gates are curved to fit bottom of tub and fit flush to impede any product from clinging to a discharge picket and not being thoroughly mixed. Either swing-plug or

Highly Intimate Blends in 1 to 2 Minutes

Blends while discharging; No segregation or flotation

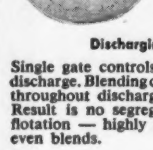
Sturtevant Rotary Blenders start 4-way blending while charging, continue it during discharge, thus producing highly intimate, even blends of dry and semi-dry materials — within 3 to 5 minutes of start of charging.

Six complete blending cycles per hour are common. And Sturtevant's special action produces no particle reduction, cleavage or attritional heat — is highly effective yet gentle and safe even with explosives.



Receiving

Scoops cascade material as drum rotates. Movement forces material from both ends to middle. Thus blending is 4-way right from start of charging.



Discharging

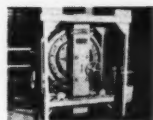
Single gate controls charge, discharge. Blending continues throughout discharge phase. Result is no segregation or flotation — highly intimate, even blends.



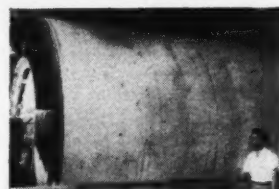
Self-cleaning, dust-sealed drum; one-man accessibility

Operation of Sturtevant Blenders is self-cleaning — drum interiors are completely dust-sealed. For inspection of all models, one man simply loosens a few lugs to remove manhole cover — quickly and easily.

Nine standard models with capacities to 900 cu. ft.



10 cu. ft. Sturtevant Blender at U.S. Steel Corp.'s new Applied Research Laboratory (Raw Materials Division) in Monroeville, Pa. This unit handles batches up to 500 lbs. — is ideal for pilot work and small runs.



One of four 450 cu. ft. Sturtevant Blenders at Celvire Plant of Celanese Corp. (Rock Hill, N. C.). These large units handle up to 20,000 lbs. batches — have a 9-year record of meeting the most exacting blending requirements.

Fully or semi-automatic, or manually controlled operation

Constructed of carbon steel, stainless steel or Monel metal, Sturtevant Rotary Blenders are engineered to fit each customer's needs — can be supplied with injector sprays and any desired control system.

For more on Sturtevant Blenders, request Bulletin No. 080B. (Bulletins also available on Mixers, Air Separators, Micronizers, Crushers and Grinders.) Write today. STURTEVANT MILL CO., 119 Clayton St., Boston, Mass.

Check 4354 opposite last page

Check 4356 opposite last page

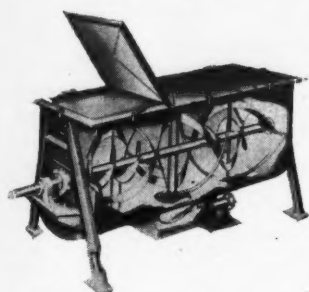
CHEMICAL PROCESSING



Tub ends of blender are rounded to prevent material from hanging in corners

slide-type discharge gates are available.

Shaft seals and couplings also have sanitary design. They can be quickly removed from ribbon assembly for maintenance without disturbing bearings or shaft stub. Pillow-block, outboard bearings are heavy-duty, self-aligning, and



Mixer has sanitary design, can mix dry or semi-dry materials

anti-friction. Blender's sectionalized cover with quick-action clamps is easily removed. Lip on top edge of tub is rolled to eliminate sharp edges. Cover is sealed with soft neoprene gasket to assure dust-tight fit.

(Industrial ribbon blender is product of Strong-Scott Mfg. Co., 451 Taft Street NE, Minneapolis 13, Minn.)

Check 4357 opposite last page.

Tumbling media of all kinds for barrel finishing operations are treated in 20-page booklet designed as practical handbook for supervisors and operators. Applications, functions, fixturing and linings, compounds and cleansers, do's and don'ts, on use of water, and analyses of typical tumbling jobs are covered. "Tumbling Media for Barrel Finishing" — Electro Minerals Div., The Carborundum Co., Niagara Falls, N. Y.

Check 4358 opposite last page.

EMERY

Engineered

WEIGHING SYSTEM

NEWS

HYDRAULIC CELLS "NATURALLY" DAMPEN OUT OSCILLATIONS OF VIBRATORY LOADS

Precision weighing of a vibratory load poses a troublesome problem for the instrument man. This is particularly true if the oscillations of the vibrations are irregular in both magnitude and time.

Where effort is made to use electrical load cells to do this job, filters are employed. In many instances, the drift of the filter is greater than the desired measurement.

Engineering-wise it is a well-known fact that oil has within itself the natural property of dampening out vibrations. This, plus the proper engineering of tubing and valves, make the Emery Engineered Weighing System the most effective method available today for solving the problem of dampening out troublesome vibrations to give precision weighing of vibratory loads.

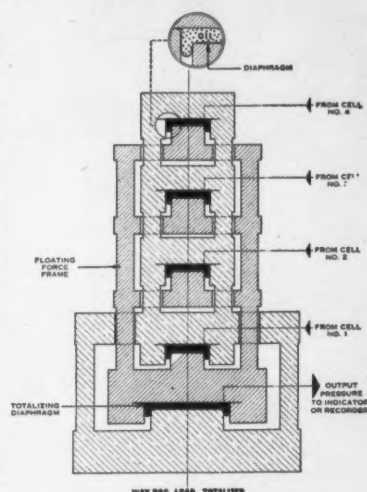
When writing, refer to Item 1009

WAY-PAC LOAD TOTALIZER UNIT COMBINES HYDRAULIC CELL LOADS

The new, simple, self-contained Emery WAY-PAC Load Totalizer Unit, a device for combining the loads on two, three, or four WAY-PAC Cells, has a sensitivity of 1 part in 5,000 and will accept the maximum capacities of both the 1,000 lb. and the 5,000 lb. cells. It is shock resistant, weather-proof, and is not affected by temperature variations.

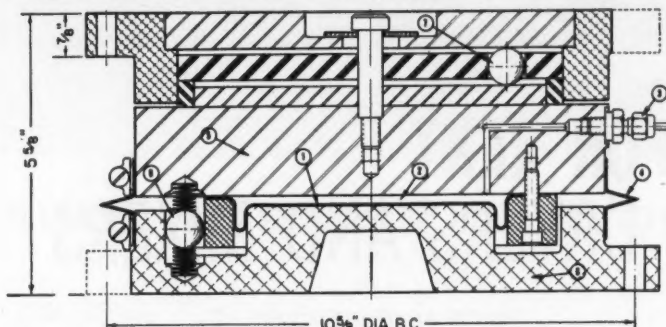
Measuring 9½" in overall height, the totalizer contains diaphragms each of which exerts a load on a floating force frame. The force frame, in turn, exerts this total load on the totalizing diaphragm where it is again converted into a combined output hydraulic pressure which represents the combined load on two, three, or four WAY-PAC cells. All types of indicating, recording and controlling instrumentation may be used in conjunction with the WAY-PAC Load Totalizer.

When writing, refer to Item 1006



The new WAY-PAC Load Totalizer combines the loads on two, three or four WAY-PAC Load Cells.

WAY-PAC HYDRAULIC CELL LINE IS NOW EXPANDED TO 5,000 LB. CAPACITY



1 DIAPHRAGM 2 OIL 3 OIL FITTING 4 PROTECTIVE BOOT (neoprene)
5 BAR STOCK ALUMINUM 6 CAST ALUMINUM 7 ROLLING BALL 8 POSITIONING BALLS
Cross section of the new 5,000 lb. capacity WAY-PAC Compression Cell with the exclusive Emery "rolling ball head" (Type AC-5-RB).

The recently-introduced line of Emery WAY-PAC Hydraulic Load Cells has now been expanded to include capacities of 5,000 lbs. The original WAY-PAC line was limited in its rating up to 1,000 lbs.

The WAY-PAC 5,000 lb. cells are similar to the previous 1,000 lb. cells in manufacture but the new dimensions

are different. Included in the line are: the AC-5, Compression; the AC-5-RB, Compression with "rolling ball" head; the AU-5, Tension; the AT-5, Cable Tension; and the AD-5, Strut Cell. The same instrumentation which teams up so well with the 1,000 lb. series works equally well with the new 5,000 lb. line.

When writing, refer to Item 1008

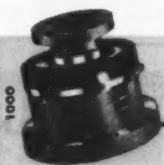
NEW 19½" DIAL INDICATOR WILL IMPROVE ACCURACY OF CELL PRESSURE READINGS

Taking pressure readings with increased accuracy is much easier with the new Emery 19½" dial indicator. Previously, the largest dial offered measured 16½" in diameter.

Since the basic objective of dial reading is accuracy, our 19½" indicator makes possible greater accuracy than ever before. Because of the larger scale length, graduations can be better matched to the job. Easy and accurate readings are a basic advantage with the new Emery 19½" indicator.

When writing, refer to Item 1007

The A. H. Emery Co., New Canaan, Conn.			
I am interested in the following:			
Item 1006	<input type="checkbox"/>	Item 1008	<input type="checkbox"/>
Item 1007	<input type="checkbox"/>	Item 1009	<input type="checkbox"/>
Seeing Representative <input type="checkbox"/>			
Name _____			
Title _____			
Company _____			
Address _____			
City _____		State _____	



THE A. H. EMERY COMPANY
New Canaan, Conn.

Engineered WEIGHING SYSTEMS



Check 4359 opposite last page

PROCESSING EQUIPMENT

Offer complete line of porous carbon filter tubes

Uses: Filtering corrosive solutions in chemical and allied fields.

Features: Porous carbon filter tubes are available in wide variety of styles suited to any type of tube-style filtering equipment.

Description: Tubes 36" long of any internal diameter and up to 6 1/2" outer diameter can be machined from available stock. Typical configurations of porous carbon filter tubes include plain open-end tube, counterbored tube, and blind-end tube with a collar flange.

Grade-40 porous carbon counterbored filter tubes, with 2 1/8" inner diameter, 36" long, are also available.

(Further information about porous carbon filter tubes can be obtained from National Carbon Company, 30 E. 42nd Street, New York 17, N.Y.)

Check 4361 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

High-vacuum equipment for solving difficult processing problems is discussed in 12-page bulletin. Specifications and diagrams also appear in Bul PE-98 — Process Equipment Div., Rodney Hunt Machine Co., Orange, Mass.

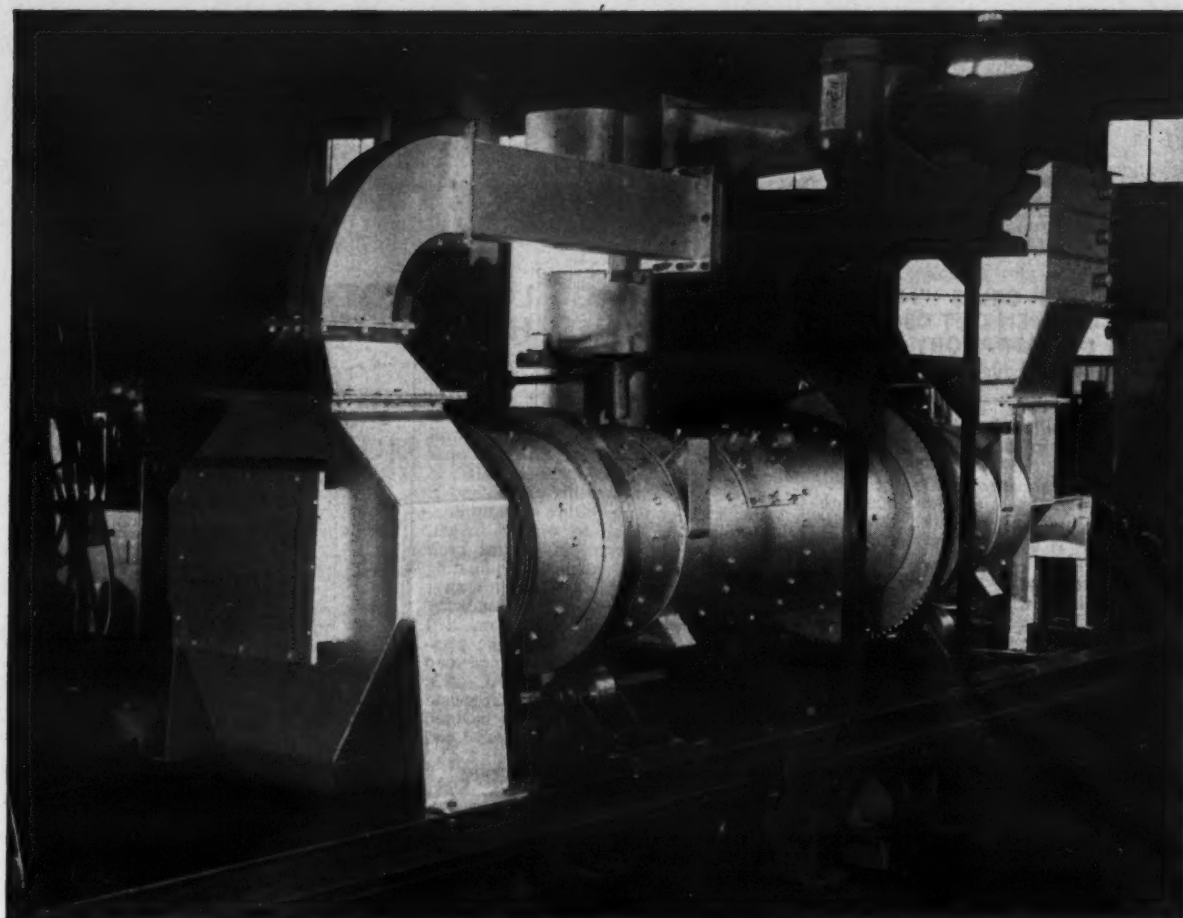
Check 4362 opposite last page.

Aspirated grinding plant featuring vibrating grinding mill for processing of wide variety of materials is described in company bulletin. Plant is said to require less than half space needed by similar capacity equipment. Bul 07B7138—Allis-Chalmers Manufacturing Company, Milwaukee 1, Wis.

Check 4363 opposite last page.

For more information on product at right, specify 4364 . . . see information request blank opposite last page.

CHEMICAL PROCESSING



Pilot-scale Louisville Dryer available on rental or purchase basis

FOR RENT PILOT PLANT DRYERS AND MIXERS

Rent this equipment when

1. The material changes physically or chemically on aging.
2. The material is hazardous and requires special handling by your own personnel.
3. Long duration tests are required for equipment evaluation.
4. Completion of a pilot plant is required at no additional capital expense.
5. Product security prevents release of samples.
6. Large quantities of finished product are needed for application studies.

Units are fabricated of stainless steel and are self-contained. Rental charges may be applied against purchase of production-sized equipment.

General American engineers will give technical assistance. If in-plant testing is not required, you can predetermine results at our complete East Chicago pilot plant. For further information, call or write. You'll find, it pays to plan with General American.

Available:	
Louisville Steam Tube Dryer	(1' x 8')
Louisville Rotary Reactor	(1' x 8')
Louisville Rotary Solvent Stripper	(1' x 8')
Louisville Rotary Vacuum Dryer	(1' x 8')
Louisville Direct Heat Dryer	(1' x 8')
Turbo RDC Extraction Column	
Turbo Bench Scale and Small Pilot Mixers	

Process Equipment Division
GENERAL AMERICAN TRANSPORTATION
135 South LaSalle Street, Chicago 90, Illinois
Offices in Principal Cities
In Canada: Canadian Locomotive Co., Ltd., Kingston, Ontario



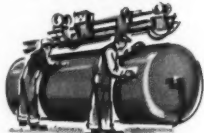
Louisville Dryers
CORPORATION

Check 4360 opposite last page

Quiet...Pressure Vessels at Work



ENGINEERING



FABRICATION



FIELD ERECTION

Looks quiet, doesn't it?

Yet inside, this new refinery is pulsating with life—surging with activity to produce fuel for millions of thirsty carburetors.

And pressure vessels like those shown above are being built day-in, day-out at Solar Chicago. Meeting rigid and unusual specifications is simple for us. It's all in a day's work.

Whatever you need in pressure vessels, and whenever you need them, why not take advantage of our experience and "know-how".

We are geared to fill your needs promptly.

May we hear from you?



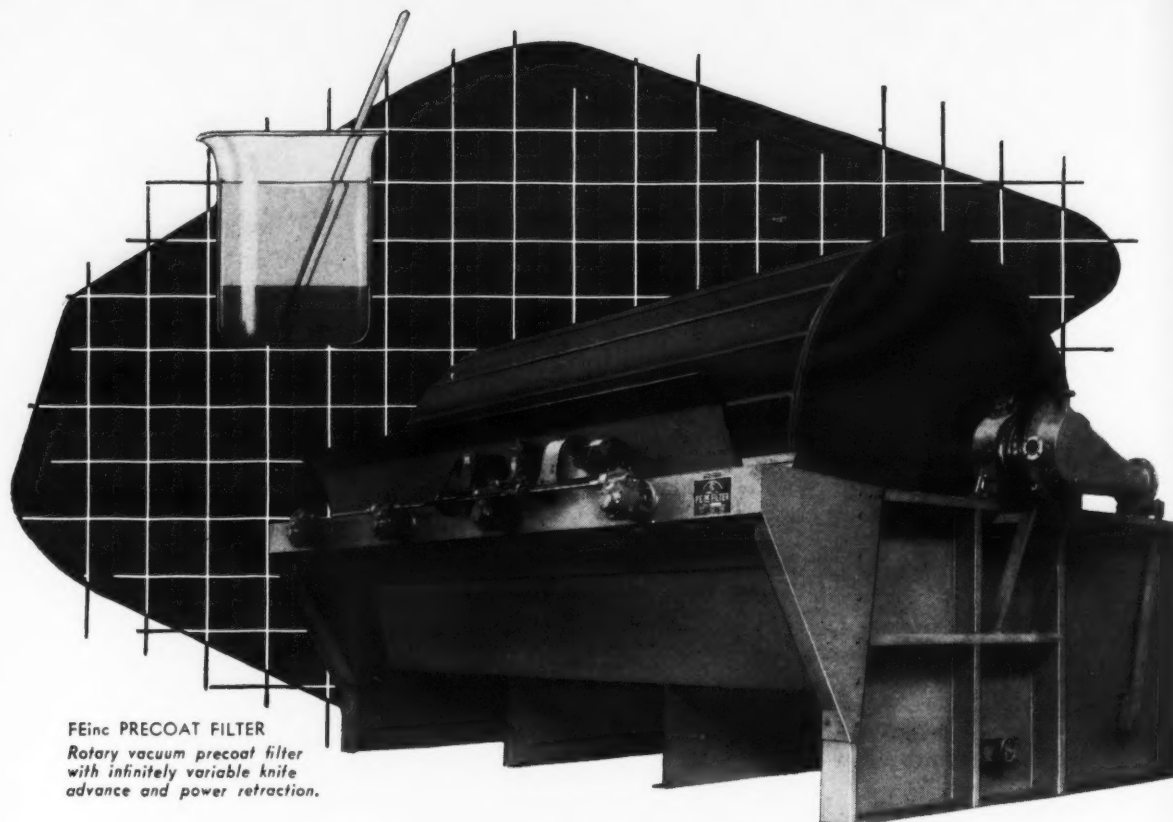
Solar Chicago

DIV. U.S. INDUSTRIES, INC.

6400 W. 66th St., CHICAGO 38, ILL.

Telephone POrtsmouth 7-8900

FORMERLY CHICAGO STEEL TANK CO.



FEinc PRECOAT FILTER
Rotary vacuum precoat filter
with infinitely variable knife
advance and power retraction.

Custom Filter Design

BEGINS WITH YOUR FILTRATION PROBLEM

Your processing requirements are king at FEinc. They dictate the type of filter to be built, its size, the materials used, and the special refinements necessary to assure highest possible operating efficiency.

For example, a FEinc Precoat Filter designed to meet your particular needs pays off fast in

trouble-free operation, dryer cake discharge and high clarity of effluent.

If you require higher output in limited floor area and a long filtration cycle coupled with the above advantages, FEinc *custom design* can give it to you.

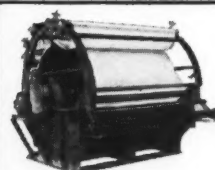
Send us your filtration problems. Specific recommendations provided without obligation.

See our insert in Chemical Engineering Catalog

For a
Bigger Yield

FE INC[®]

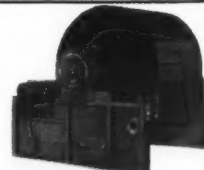
FILTRATION ENGINEERS
AMERICAN MACHINE AND METALS, INC.
EAST MOLINE, ILLINOIS



STRING



HORIZONTAL



SCRAPER

SPECIALISTS IN LIQUID-SOLIDS SEPARATION

Check 4365 opposite last page

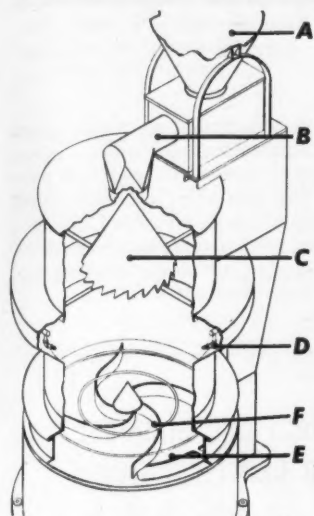
PROCESSING EQUIPMENT

Continuous blending of solids or solids and liquids

Uses: Wide application for blending solids, and solids and liquids. Also for dust prevention by wetting of solids.

Features: Components available for particular wear and corrosive conditions. Mixing blades are easily replaced.

Description: Materials to be treated or blended are fed from surge hopper (A) proportionally into blender via



Continuous blender. Letters denote components mentioned in story

controlled volumetric feeder (B) into apex of cone (C). Cone causes material to form circular, falling curtain as it leaves base periphery of cone.

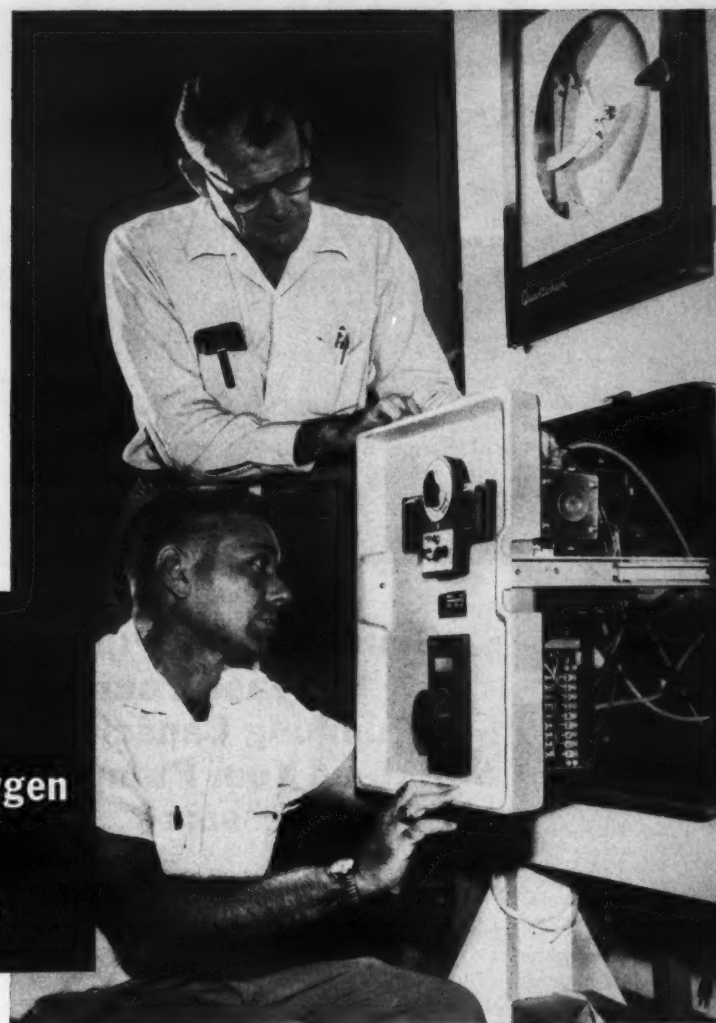
At base of cone, spray headers (D) can be provided to disperse any desired liquid into mixture in desired proportion. Liquid is sprayed on blended, dry material from both inside and outside curtain as it falls on retention plate (E).

Further blending is made on retention plate by mixing blades (F) that automatically discharge material. If only solids are blended, a special liquid can be used to disperse particles to prevent dust.

(Verticone continuous-flow blender is a product of The Johnson-March Corp., 1724 Chestnut St., Philadelphia, Pennsylvania.)

Check 4366 opposite last page.

In Florida power plant...
**quantichem analyzer
records dissolved oxygen
colorimetrically
0 to 30 ppb.**



EVEN a few parts per billion of dissolved oxygen in water for power station boilers reduces overall efficiency and economy. Three months ago, the Florida Power Corp., St. Petersburg, Fla., put on stream a Milton Roy Quantichem colorimetric analyzer in its Bayboro Station to survey dissolved oxygen in returned condensate from steam turbine condensers.

In addition to this application, other Quantichem automatic analyzers are available for analyses of silica (0-50 ppb), residual chlorine (0-3 ppm), hardness (0-3 ppm) . . . as well as for phosphates, hydrazine, chlorides, and many others.

Write for information on your particular application.
Milton Roy Company, 1300 East Mermaid Lane,
Philadelphia 18, Pa.



Controlled Volume Pumps
Quantichem Analyzers • Chemical Feed Systems

Check 4367 opposite last page

PROCESSING EQUIPMENT

Granular products mixed rapidly and efficiently with gas blender

Uses: Mixing and blending various free-flowing solid materials.

Features: Blender uses air or gas to conduct mixing. Results are obtained quickly and efficiently with no stratification or channeling. Device can handle materials with wide variations in particle sizes, shapes, densities, and quantities. Blender has no moving parts except for inserted stir mechanism.

Description: Gas-activated solids blender consists of vertical conical shell in which a central rotating shaft is located. Shaft has number of stirrer blades attached to it in such a way as to produce a definite solids circulation pattern.

Air or gas is admitted at apex of cone at predetermined



Gas-activated solids blender has rugged construction, occupies only minimum floor space

rate sufficient to induce solids fluidization in apex region. Action of air current and paddles extending into apex causes solids to flow upward in center of cone, overspill at top of the charge, and descend along wall back into apex.

here is the world's smallest and simplest strip chart recorder!



- **AMPLE STORAGE:** Contains 63-ft. chart roll, or 31 days' recording at one inch per hour. Useful chart width 2 3/4".
- **ACCURATE:** Galvanometer pointer swings free for maximum accuracy, being clamped briefly for marking.
- **INKLESS:** Recording process is completely dry, utilizing special pressure sensitive paper. Method provides remarkable definition.
- **RECTILINEAR:** Advanced design provides true rectilinear recording free from distortion.
- **RELIABLE:** Positive synchronous motor drive with sprocket engaging holes in paper for accurate time indication.
- **VERSATILE:** Portable or panel mounting models. Stocked in a variety of scales and chart speeds.

WRITE TODAY FOR LITERATURE

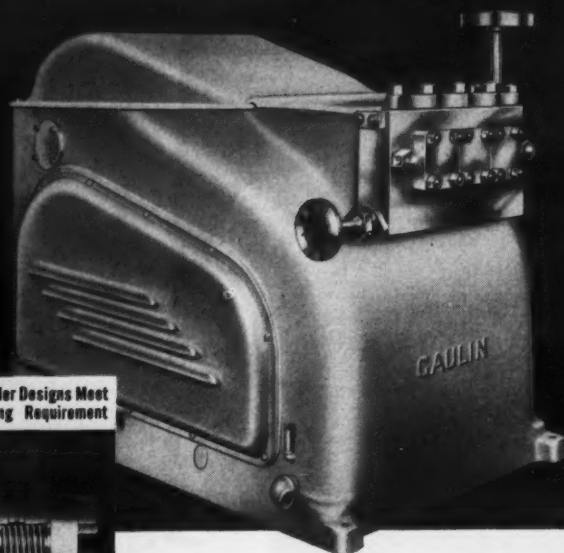
rust industrial co., inc.

130 Silver Street, Manchester, N. H.

* Subject to change without notice.

Check 4369 opposite last page

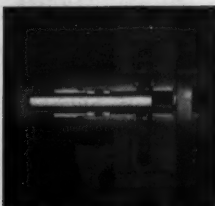
CHEMICAL PROCESSING



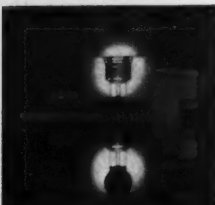
5 Basic Cylinder Designs Meet Every Pumping Requirement



Spring loaded packing



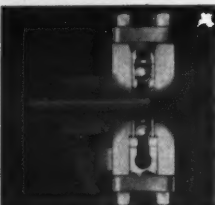
Packing adjusting screw style stuffing box



Poppet Valve, stainless steel



Ball valve, hardened inserted valve seat



Ball valve, removable seats

Gaulin Triplex Pumps Increase Your Pumping Capacity, Extend Your Pumping Pressures ...

Reduce Operating and Maintenance Costs, Too!

Gaulin Horizontal Triplex Pumps handle large volume of all types and densities of fluids. Rugged, compact and dependable, they provide long service life at minimum maintenance costs in transfer, metering and spray drying applications.

Horizontal Design provides well area separating product from crank case.

Well Area can be gasketed for maintaining sterility . . . or for inert compatible chemicals (gases or liquid) for hazardous materials.

Gaulin Cylinder can be disassembled in minutes. Capacities from 50 to 6500 GPH . . . pressures from 500 to 12,000 psi.

Write for Bulletin P-55. At the same time ask for GTA . . . *Gaulin Technical Assistance* . . . for experienced advice and factual data on the best method to move or blend your product.



World's largest manufacturer of stainless steel reciprocating rotary, pressure exchange pumps, dispersers, homogenizers and colloid mills.

Check 4368 opposite last page

PROCESSING EQUIPMENT

Circulation pattern is rapid and continuous. Apex region acts as primary blending zone, with non-fluidized solids above apex blanketing the fluidized region, thereby minimizing entrainment of fine particles.

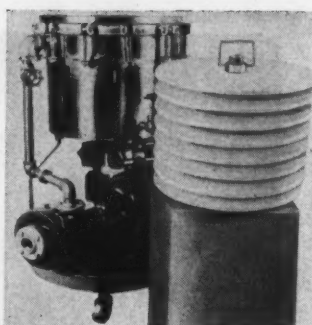
Air or gas requirements vary according to size and density of materials being processed. Machine is of simple, rugged construction and occupies only minimum floor space.

(Gas-activated solids blender is product of the Colonial Iron Works Company, 17643 St. Clair Ave., Cleveland 10, O.)

Check 4370 opposite last page.

Line of cutters for dicing, pelletizing, or cutting plastics, synthetic textile filaments, and glass fibers are outlined in 4-page bulletin. Photographs illustrate various units. Bul 217 — Taylor-Stiles & Company, Riegelsville, N.J.

Check 4371 opposite last page.



Filter plates

... are assembled as removable cartridge similar to standard horizontal plate type. Disassembly of each plate is not required to replace spent cake and filter paper. Complete plate cartridge can be cleaned as a unit.

(Wash-off plate cartridge is a product of Sparkler Manufacturing Company, 219 Lake Street, Mundelein, Ill.)

Check 4372 opp. last page.

LOW COST FLUID CONTROL HIGH PRESSURES (and low, too)

EXCLUSIVE NYLON STEM WIPER

Positively prevents foreign matter from scratching or pitting stem, harming O-ring seal.

GUARANTEED LEAK-PROOF O-RING SEAL

Forget about packing adjustments, leaks through stem with tough, pliable O-ring seal.

FORGED CARBON STEEL BODY

Heavy duty, weldable carbon steel body in globe or angle patterns, selection of male or female connections.

DIE-CAST ALUMINUM HANDWHEEL

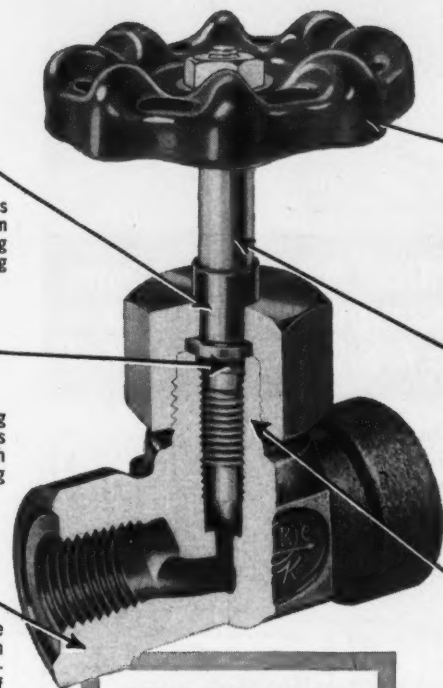
Easy grip, non-slip, die-cast handwheel gives you smooth turning down for quick, accurate flow control.

CENTERLESS GROUND STEM

Stainless steel, centerless ground stem assures perfect fit, positive shut-off.

SAFE, INTEGRAL BONNET

One-piece, forged steel body and bonnet insures against blow-out, gives added measure of safety.



HOKE'S PERFORMANCE GUARANTEE —

Every Valve Leak-Tested!

SERIES 100 FORGED NEEDLE VALVES

FREE: A sample valve is yours for the asking. Put this heavy duty, versatile valve to the test on hydraulic lines, manifolds, air lines, test stands. Use it for regulating or shut-off of water, oil, gas. Temperature range —40 to 200°F. Pressure rating; vacuum to 10,000 psi. Write to us on your company letterhead for the full story and your FREE SAMPLE VALVE.



HOKE INCORPORATED

Fluid Control Specialists

45 PIERMONT RD., CRESSKILL, N.J.

Check 4374 opposite last page

PREFERRED



CUSTOM ENGINEERED

RECTIFICATION

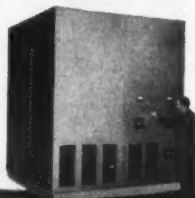
- Germanium
- Silicon
- Selenium

Of the thousands of Sel-Rex Rectifiers in use, a large percentage are "repeat orders"—units purchased only after an original installation had thoroughly proven itself.

Our users include the country's foremost electrical and electronic concerns*—companies best qualified to evaluate rectifier equipment.

*names on request

Send for FREE "GUIDE" to Industrial Rectifier Equipment.



Rectifier Division

SEL-REX CORPORATION

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Representatives in Principal Cities

"Complete Semiconductor Power Conversion Systems for any AC to DC application"

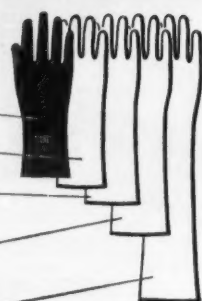
Check 4373 opposite last page



These Stanzoil Milled Neoprene Gloves
Guarantee Positive Liquidproof Protection in
103 Basic Oils, Acids, Caustics, Greases, Solvents

Black All Neoprene Stanzois With Non-slip Grip

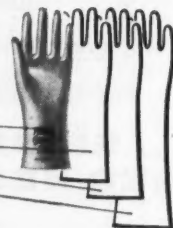
Model	Weight	Fingers	Length
N-31	Light	Straight	10½"
N-35	Light	Curved	10½"
N-32	Medium	Straight	11"
N-36	Medium	Curved	11"
N-41	Heavy	Straight	12"
N-44	Heavy	Curved	12"
N-51	Heavy	Straight	14"
N-33	Light	Straight	14"
N-54	Heavy	Curved	14"
N-71	Heavy	Straight	18"
N-73	Light	Straight	18"
N-74	Heavy	Curved	18"



White All Neoprene Stanzois With Smooth Finish

Model	Weight	Fingers	Length
N-30	Light	Curved*	10½"
NW-31	Light	Straight	10½"
NW-32	Medium	Straight	11"
NW-41	Heavy	Straight	12"
NW-51	Heavy	Straight	14"

*Non-slip



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241 Tiffin Road . . . Willard, Ohio

(Neoprene)

Please send me:

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☐ 17" x 22" Full Line Glove Wall Chart
☐ Job Description Form For Free Hand Protection Analysis

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Address.....

City..... Zone..... State.....

Requested by.....

Check 4375 opposite last page



**PLANT ENGINEERING
MAINTENANCE & SAFETY**
... electrical & mechanical developments

Three of the non-lubricated valves of the 20 in use at Clark Refining can be seen in view of section of storage area



CP Staff Photo

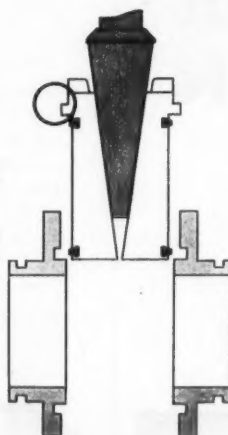
Experience of refinery shows that recently developed non-lubricated valve — with unique method for positioning disc without dragging it across seat — not only furnishes leakproof service, but . . .

Practically eliminates wear on valve seating surfaces

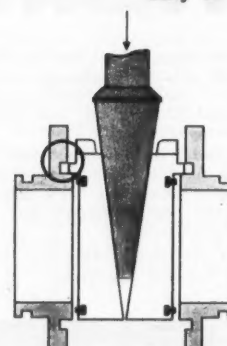
JOHN C. STEEVENS, Assistant Editor
with KEITH FORRY, Assistant Superintendent
Clark Oil & Refining Corporation
Blue Island, Illinois

Problem: Valves controlling flow in an LPG storage area at Clark Oil & Refining were not giving satisfactory service. The valves were operating at atmospheric temperature and at pressures of 250 psi on pump discharge side and 190 psi on suction side.

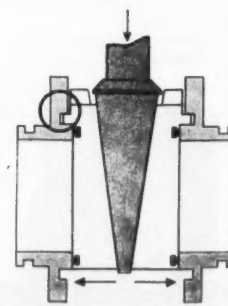
These valves permitted flow in only one direction. Whenever it was necessary to repack valves, line had to be de-



Valve fully open. In closing, discs and spreader move down, perpendicular to flow



Discs are positioned without drag across seat, then moved horizontally as spreader continues downward



Valve fully closed. Spreader holds discs vapor-tight against seat rings

pressurized before starting job.

Solution: Twenty vapor-tight non-lubricated double block and bleed gate valves were installed in the LPG lines in March 1958. These valves are operated by raising or lowering threaded stem which terminates in an assembly consisting of a spreader and a pair of sealing discs.

Downward movement of the stem automatically positions discs in relation to seat rings. Further downward movement produces wedging action which forces discs into contact with seat rings, resulting in positive shutoff upstream and downstream. Teflon inserts make seal vapor tight.

An effective method of guiding disc assembly, completely independent of valve body, maintains clearance between discs and face of seat rings during operation. Valve is easily assembled and disassembled.

Results: Vapor-tight valves have not required any maintenance since installation, and have provided very satisfactory service. There has been no leakage problem. Flow through these valves may be in either direction.

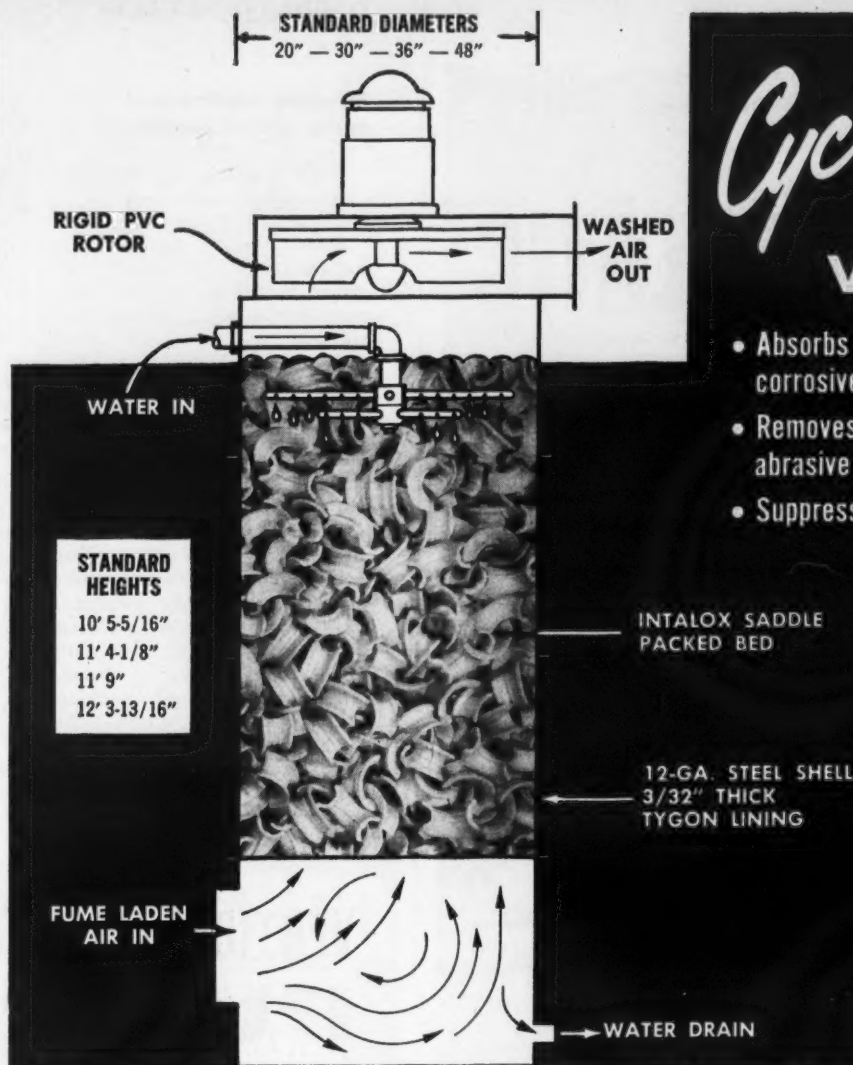
Method of guiding disc assembly safeguards against wear, frictional drag, wiping, and consequent galling of sealing surfaces. Since seal is effected without use of lubricants, costly servicing is eliminated. Also, product cannot be contaminated by lubricant. Valve is provided with both bleeder and clean-out connections.

(Keroseal valve is product of Kerotest Manufacturing Co., 2525 Liberty Ave., Pittsburgh 22, Pennsylvania.)

Check 4376 opposite last page.

Speed reducers, shaft-mounted, are described in 24-page book containing engineering and selection information on: single reduction drives in six sizes, with nominal ratios of 5 to 1 and capacities up to 50 horsepower; and double reduction drives in seven sizes, with nominal ratios of 15 to 1 and up to 40 horsepower. Book 2618 — Link-Belt Company, Dept. PR, Prudential Plaza, Chicago 1, Ill.

Check 4377 opposite last page.



Cyclonaire

FUME WASHER

- Absorbs noxious and corrosive fumes
- Removes irritating and abrasive dusts
- Suppresses oil and acid mists

The "Cyclonaire" is a surprisingly compact wet bed scrubber. It will fit almost anywhere, but it does a fume removal job formerly possible only with expensive custom-designed units. Removal of many gases (of 1% concentration or less) is up to 99% effective. Low power requirements make it very economical to operate.

The standard "Cyclonaire" consists of a bottom section containing a packing support plate, fume intake duct, and liquid drain; two intermediate sections packed with Intalox Saddle Packing; a distributor section containing a water or liquid inlet and liquid distributor; and

a top section containing the blower, drive motor and washed air outlet.

The unit is made of 12 gauge steel, lined with 3/32" thick Tygon sheet plastic. The rotor is made of rigid PVC plastic. All exterior surfaces are protected with Tygon "ATD" Hot Spray Paint.

The "Cyclonaire" is available in four sizes with rated capacities of 750, 1650, 3500 and 6000 cfm.

Its low initial cost, its low operating cost, its high efficiency make the "Cyclonaire" a logical choice for a wide range of fume scrubbing operations. Full technical data in Bulletin FW-10. Write for it today.



PROCESS EQUIPMENT DIVISION



U. S. STONEWARE

AKRON 9, OHIO

376F

Check 4378 opposite last page

world's smallest corral
for 200 horses*
(*horsepower, that is)

...THE VAPOR HEATING CORPORATION

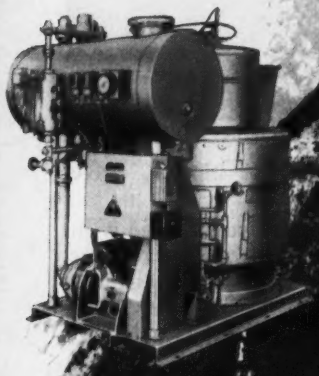
DRUM MODULATIC

WATER TUBE BOILER—200 BHP in only 6' x 6'

Most heat and power packages let their horses run wild—spread them all over your plant...and that's mighty expensive range area. Vapor packs the same number of horses in about one-quarter the space of what old-fashioned boilers need. Even if you only valued inside area at \$20.00 a sq. ft., you'd save a whopping \$2400 on space alone. And you'd save plenty more on maintenance and long life...the simple fact is this:

MODULATICS NEVER WEAR OUT

Ingenious design makes every part accessible—easily replaced should the need arise. And, Vapor guarantees their Modulatic coils 5 full years including up to \$50.00 labor allowance! Sizes: 20 to 200 HP...670,000 to 6,690,000 BTU per hr.



DEFERRED PAYMENT PLANS AVAILABLE IF YOUR CASH HAS OTHER WORK TO DO

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Send me free literature: ☐ Drum Modulatic Bulletin 475;
☐ Modulatics for pressures to 1000 psi, Bulletin 586;
☐ Extended Payment Terms Bulletin 486; ☐ Hydrolatic Hot Water Boiler Bulletin 490.

Name

Address

City, Zone, State

Check 4379 opposite last page

ENGINEERING & SAFETY

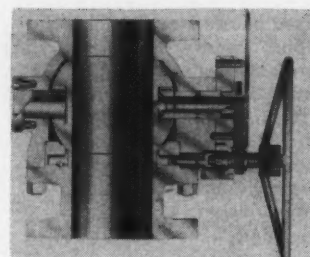
Provides positive seal under severe conditions

Teflon packing ring fits tightly against valve plug

Uses: Unit is suitable for handling nearly all liquids and gases, including aromatic hydrocarbons, acids, alkalis and solvents.

Features: Under extremely severe operating conditions, it provides positive and enduring bubble-tight seal. Valve can be opened and closed quickly and with little effort. No lubrication is required.

Description: Ball plug valve has positive valve port sealing accomplished by mechanically compressing fully confined, gasket-type Teflon packing ring tightly against valve plug each time valve is closed. Tightly compressed packing ring provides a bubble-tight seal against pressure from either direction.



Long, trouble-free life is claimed for non-lubricated ball plug valve because of easy operation and little stress on operating parts

Sealing surfaces of valve are held out of sliding contact with other parts and are not subject to wear. Sealing elements are suitable for use throughout temperature range of -100°F to 450°F.

(Type K ball plug valve is product of Hydril Co., 714 West Olympic Blvd., Los Angeles 15, Calif.)

Check 4380 opposite last page.

VERTICAL JACKETED PUMPS

for sulphur, resins, waxes and other liquids which tend to solidify at low temperatures.

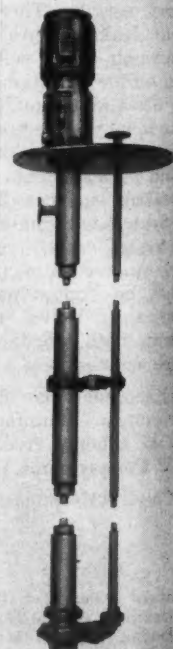
- Jacketed throughout. (For submerged operation, all parts save pump itself are jacketed.)
- Heating spaces vented, self-draining.
- Heating medium: steam, dowtherm, etc.

Write for Bulletin 203-7.

Lawrence Vertical Jacketed Pump



LAWRENCE PUMPS, INC.
371 Market Street, Lawrence, Mass.



Check 4381 opposite last page

CHEMICAL PROCESSING

Detects combustible gas on the spot

Uses: Unit is designed for detection of hazardous vapors.

Features: Rugged, lightweight analyzer is easy to operate in palm of hand for quick, on-the-spot checking of work areas. Unit is self contained with a long battery service life.

Description: Pocket-size combustible gas analyzer with case and all accessories measures 4 x 6 x 5 inches and weighs 3 3/4 lb. Unit is simply operated. One knob turns detector "on" and zeros meter. Pilot light illuminates easily read dial which features 2 1/2" scale. Sample hose and aspirator bulb snap instantly into either side of instrument for left or right hand use.

Compact leather case holds aspirator bulb, 5-foot sampling hose with short probe, spare battery, and screw driv-



Lightweight, compact detector can be held in palm of hand for quick check of combustible gases

er. Spare filament is also included. Instrument is not affected by vapors of gasoline containing tetraethyl lead.

(Combustible gas analyzer is product of Davis Emergency Equipment Co., Inc., 55 Hal-leck St., Newark 4, N.J.)

Check 4382 opposite last page.

**THE
BIGGEST,
NEWEST
IDEA
IN
INDUSTRIAL
GLOVES!**



**• PVC Gloves by Jomac,
job-proved for extra safety, extra wear**

Check these advantages . . .

- **Extremely tough**—Last two to five times longer than ordinary industrial gloves
- **Very flexible**—Give greater dexterity than any other coated gloves. Made in sizes for maximum comfort
- **Highly resistant**—Nonflammable, nonoxidizing and resistant to practically all chemicals—will not crack or peel

Give your employees the maximum protection afforded by North PVC Gloves. There is a size to fit every hand—fit it comfortably, and in this way lessen fatigue and increase efficiency. You will find production going up, accident rate going down. Available in knit-wrist, band top and gauntlet types—palm and partial back coated styles.

FREE OFFER—On your business letterhead, kindly furnish details of your working conditions—and we will send you a sample pair.

We also make a complete line of North PVC chemical and foul weather protective garments and the famous Jomac loop-pile industrial gloves, handguards and safety sleeves for hand-to-shoulder protection.



1600 SERIES. Fully coated, heavy duty.



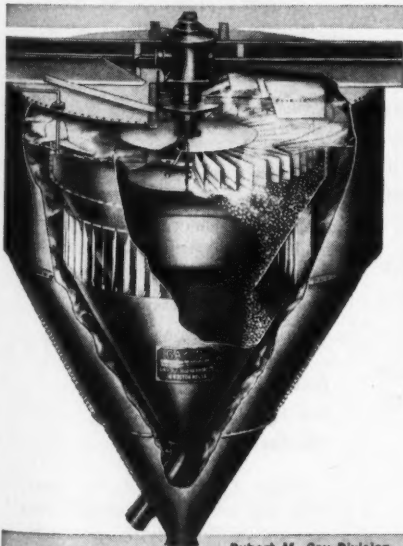
1800 SERIES. North-Grip—Permruff surface; for handling slippery surfaces.

JOMAC Inc.

Dept. N, Philadelphia 38, Pa.

Associated companies and distributors throughout the world

**USING SCREEN SEPARATIONS?
NOTHING CLASSIFIES AS
PERFECTLY AS AIR**



Robert M. Gay Division

UNIVERSAL ROAD MACHINERY CO.

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GAYCO

**CENTRIFUGAL
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SEPARATORS**

Classify practically all dry fine materials

You get:

- CLOSER SEPARATIONS
- IMPROVED PRODUCTION
- NO UNDESIRABLE OVERSIZE.

RANGE 60 to 400 mesh.

Timken bearings.

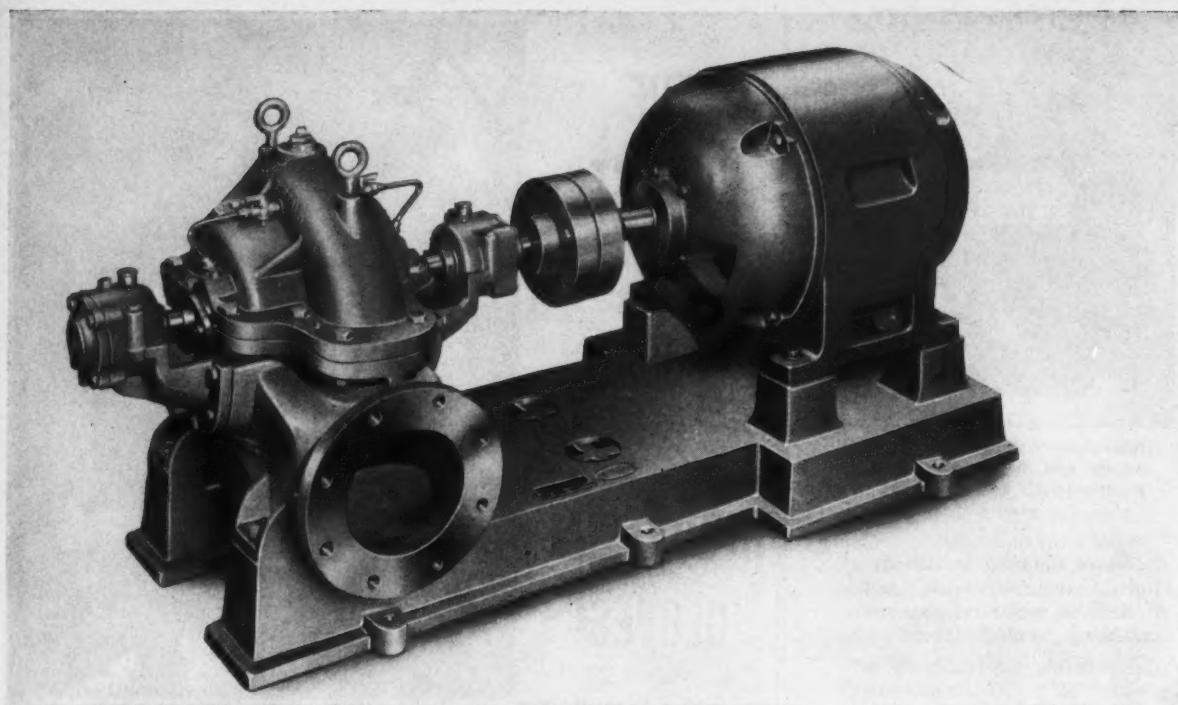
Choice of Standard or Heavy Duty Models.



this helpful booklet sent on request

Check 4383 opposite last page

Check 4384 opposite last page



"Buffalo" Double Suction Pump for Clear Water Service

3-WAY ECONOMY WITH THESE "BUFFALO" PUMPS

1. Minimum Maintenance Cost
2. Minimum of Costly Time-Outs
3. Minimum Service Costs

"Buffalo" Double Suction Pumps bring you these and many more economies because they combine superior hydraulic design with the finest quality workmanship and materials.

Lower maintenance cost and fewer expensive time-outs are the result of these "Buffalo" construction features: sturdy, machined casing with ample, simply-formed water passages — hydraulically balanced impellers assuring peak efficiency — renewable bronze wearing rings — heavy-duty ball bearings and shaft is high grade steel, machined all over, bronze covered, or solid monel metal or other alloy.

Lowest possible service costs are assured by the extra accessibility designed into these pumps. Horizontally-divided casing permits quick removal of the upper half. Thus interior parts can easily be inspected or removed without disturbing pipe connections.

Add to these economies peak efficiency and dependability and you have a pump that is unsurpassed for the most severe industrial clear water service.

For full information on the "Buffalo" Double Suction Pump, contact your nearby "Buffalo" engineering representative. Or write for Bulletin 955-S.



BUFFALO PUMPS

Division of Buffalo Forge Co.

524 BROADWAY • BUFFALO, N. Y.

Canada Pumps, Ltd., Kitchener, Ont. • Sales Representatives in all Principal Cities

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

Check 4385 opposite last page

ENGINEERING & SAFETY

Dual protection offered against vapors, fumes by receptacle

Simple, one-handed operation completes the circuit

Uses: For electrical outlets in hazardous areas.

Features: Any arcing is confined within a plug combustion chamber of dead-end receptacle. Dual protection is afforded by elimination of live contacts exposed to atmosphere, which may contain volatile, flammable, anaesthetic fumes, or explosive vapors.

Description: Simple, one-handed operation is required to complete circuit between explosion-proof receptacle and plug. No intricate mechanical interlocks are employed to permit insertion or removal of plug.

Plug is fully seated by inserting as far as it will go and turning $\frac{1}{4}$ turn to the right. Circuit is safely broken by reversal of this procedure.

Dead-end receptacles are available with or without adjustable sleeve to accommodate varying wall thicknesses and include close-up plug. Each receptacle is equipped with durable spring lift cover to prevent entrance of moisture, fumes, or dust.

Conduit hub sizes range from $\frac{3}{4}$ " to 1" for phase 1, two-wire, three-pole and for phase 3, three-wire, four-pole circuits.

("CPS" series explosion-proof receptacles are product of Appleton Electric Company, 1701 Wellington Ave., Chicago 13, Ill.)

Check 4386 opposite last page.

Develop water heater for low-pressure steam injection

Uses: Unit is able to provide hot water for installations having boilers with pressure from 15 psi and downward.

Features: Installations which have source of steam limited to low-pressure boilers can heat water with advantages of temperature control and space-saving. No floor

space is required since units are hung on walls or fixed to posts. Neither tanks nor tubes are required because water volume flows instantly at pre-set temperatures.

Description: Low-pressure steam injection water heater provides hot water flow on push-button basis. Minimum temperature fluctuation for both continuous and start-and-stop requirements is maintained. Water temperature changes are made in less than 20 seconds by simple re-setting.

Hot water volume from heater is adjustable from 5% up to full rated capacity. Capacities range from 500 to 30,000 gallons of heated water per hour.

(Low-pressure steam injection water heater is product of Water Heater Division, Pick Manufacturing Co., West Bend 3, Wisconsin.)

Check 4387 opposite last page.

Provides good bond where soldering can be used

Uses: Material is particularly recommended for repair of printed circuits and for bonding of electrical components.

Features: Material is highly conductive and has good bond strength.

Description: Conductive cement, based on epoxy resins, is 100% solids. Volume resistivity is measured at .01 ohm-cm at 25°C.

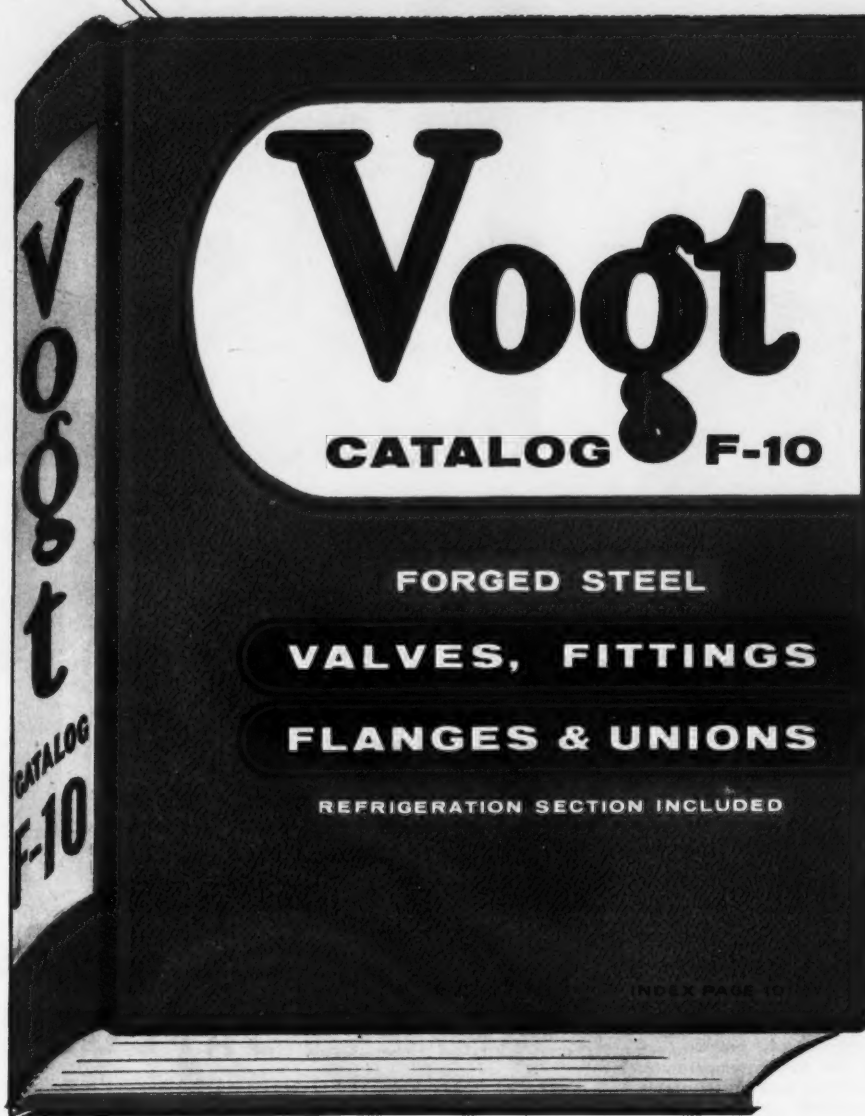
Compound will cure fully in twenty-four hours at room temperature, or in two hours at 140°F. It is supplied in convenient kit form.

(Hysol 6250 is product of Houghton Laboratories, Inc., Olean, N.Y.)

Check 4388 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

Presenting a NEW Vogt Blue Book



Catalog F-10 is the one source for the most complete line of forged steel valves, fittings, flanges, and unions available to industry. Its 432 thumb indexed pages feature new types and trims to best meet severe fluid and gas handling duties at all temperatures and pressures.

A copy of this new catalog is available to you. Please send your request, on your company letterhead, to Dept. 24A-FCP.

Leading petroleum refineries, petro-chemical and chemical plants, and power plants get top performance with safety from Vogt forged steel valves, fittings, flanges, and unions.

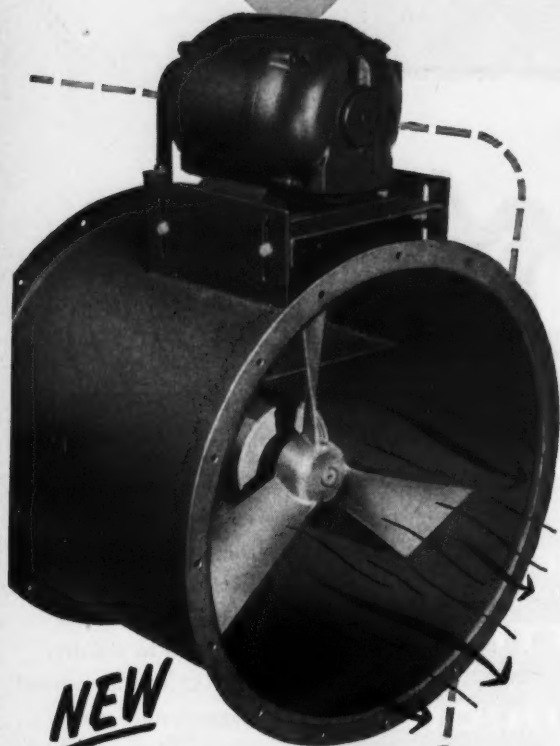


OTHER VOGT PRODUCTS:
Steam Generators, Petroleum Refinery and Chemical Plant Equipment, Heat Exchangers, Ice Making and Refrigerating Equipment

HENRY VOGT MACHINE COMPANY
LOUISVILLE, KENTUCKY

Check 4389 opposite last page

expel
FUMES, HEAT AND DUST
at LOW COST



NEW
PROPELLAIR®
belt driven Tubeaxial Fans

Type "BT" Propellair Fans can be purchased and operated at low cost to handle difficult atmospheres such as highly corrosive, explosive, inflammable, grease or dust-laden air. Straight-line design permits easy, inexpensive installation. Platforms and duct elbows are eliminated. The externally mounted Robbins & Myers motor, sealed cast iron housed bearing assembly, air-tight drum and belt-tube provide complete protection. Standard models can handle temperatures up to 450° F. Propellair "BT" tubeaxial fans are available in sizes 16" to 60" for from 2000 to 85000 CFM air delivery.

WRITE FOR BULLETIN NO. 620-CP



DIV. OF ROBBINS AND MYERS, INC.
SPRINGFIELD, OHIO

Certified
Ratings



MAN COOLER



SKY-BLAST



VANEAXIAL



EXTENDED SHAFT

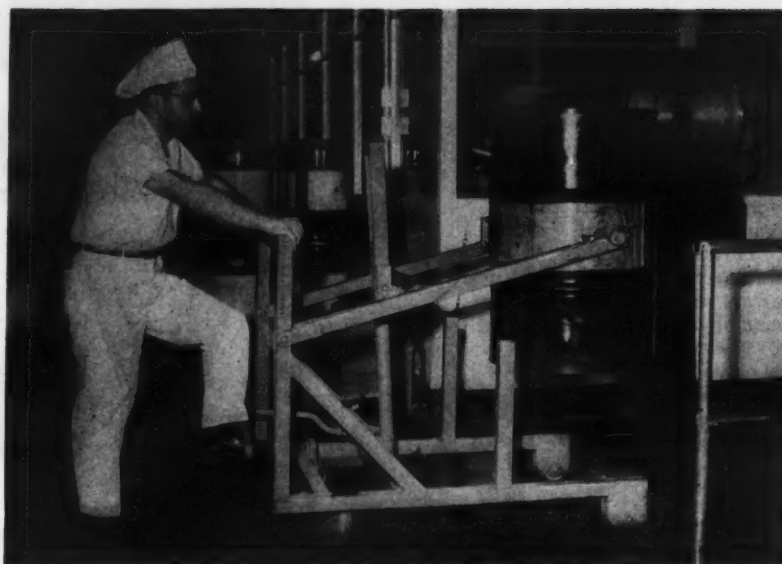


CFMA

MOVING AIR IS OUR BUSINESS

Check 4390 opposite last page

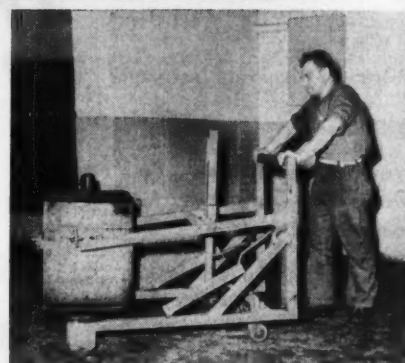
**PLANT ENGINEERING
MAINTENANCE & SAFETY**



Heavy drums can be easily picked up and moved for stacking, or scaling, or whatever is necessary, by one man. Note lift's wide straddling legs

Moving acid carboys with drum lift is simple task at Chas. Pfizer

Possibility of strain and back injuries, and accidents from dropped loads, was bothering safety department at Chas. Pfizer & Co. Inc.'s Brooklyn plant. By re-engineering the job, safety department has increased the efficiency of handling drums and . . . most important . . . strengthened its program of safety and accident prevention



Photos by CP Staff

One man handles 275-lb drums ... SAFELY

CP Editorial Staff

with ALDO OSTI, Plant Safety Engineer
Chas. Pfizer & Co. Inc.
Brooklyn, New York

Problem: Difficulties of handling heavy (up to 275 lb) drums in manufacturing departments at Chas. Pfizer's Brooklyn plant bothered the safety department. Possibility of strain injuries and accidents from dropped loads suggested that entire method of drum handling in the plant should be re-examined and re-engineered.

Solution: Key to this program of removing potential causes of hernia, backaches, back injuries, and splashing acid carboys was a hydraulic drum lift which one man could operate . . . easily . . . despite drum weight.

Drum lift has roller-bearing casters and a positive foot-operated floor lock. Relatively small size permits its use in areas where a large fork-lift truck cannot enter. And, as the Pfizer plant has low ceilings in many areas, this small size has become of great importance.

Hydraulically operated, drum lift is, of course, safe to use in all areas of the plant,

CHEMICAL PROCESSING

including locations where explosion-proof equipment would ordinarily be required.

After Pfizer had purchased drum lift, many more uses were found for it. For example, it has been used as a mixer and a bag lifter. By installation of a special girdle, lift was adapted to handle carboys.

Roller-bearing casters permit drums and other loads to be moved easily within a department. Now it is possible for drums to be scaled without calling upon a fork-lift truck.

Results: Since the original purchase of a drum lift in 1956, Pfizer has purchased five more. Safety department has been well pleased because a potential cause of strain and accidents has been eliminated.

(One-man, hydraulic drum lift is product of Sterling, Fleischman Co., Broomall, Pa.)

Check 4391 opposite last page.

Stops chemical action of harmful irritants, guards eyes, skin

Uses: As a buffering solution.

Features: Relatively small quantity of material counteracts either acids or caustics. Stops chemical action and prevents damage to eyes or skin that might result during the slow process of dilution or irrigation by water.

Description: Solution is a phosphate buffer packaged in 4, 8, and 32 oz and one gallon polyethylene bottles. To alert employees requiring first aid for chemical burns, a chemical burn station has been developed. This station, composed of large plastic backboard and a container for 32 oz bottle of phosphate buffer, attaches to any wall surface. The shatter-proof, brilliant yellow plastic backboard has complete instructions for emergency first aid treatment of chemical burns silk screened on it.

(Neutralize solution and Chemical Burns Station are products of E. D. Bullard Co., Sausalito, Calif.)

Check 4392 opposite last page.

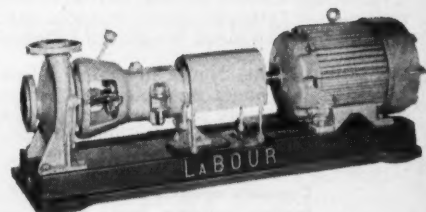
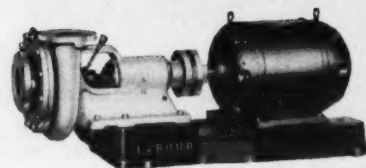
but who drops feathers in a vacuum?



In a perfect vacuum, a feather is supposed to drop at the same speed as a chunk of lead. Nobody, so far as we know, has actually tried to produce a perfect vacuum in apparatus suitable for such an experiment. In the work-a-day world, the lead beats the feathers to the bottom every time.

There are theories about pump performance, too—sound theories, demonstrable in any laboratory. In the work-a-day world of the chemical plant, however, it's *actual* performance, not theoretical, that earns a profit. And that's where LaBour has been consistently on top for more than 35 years—and still is.

Most pump service per dollar cost—that's the way to measure pump value. If you want to see proof of LaBour superiority on this basis, we'll be delighted to provide it for you. Just drop us a line.



ORIGINAL MANUFACTURERS OF THE SELF PRIMING CENTRIFUGAL PUMP

LABOUR

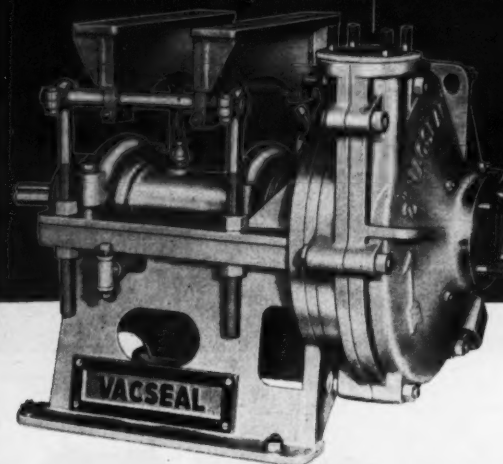
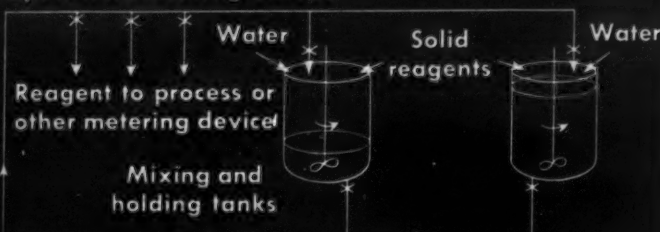
THE LaBOUR COMPANY, INC. • ELKHART, INDIANA, U. S. A.



Check 4393 opposite last page

How to lick the problem of Reagent Slurry Pumping

Manually or automatically
operated metering valves



VACSEAL PUMP

Continuous circulation is the key to moving hard-to-handle reagents in processes involving slurries of LIME, MANGANESE DIOXIDE, CARBON BLACK, FILTER AID, etc. By this tested and approved slurry pumping method VACSEAL delivers a constant supply of solution containing solids in suspension — your safeguard against malfunctioning and system clogging. Typical applications include: partial neutralization of acid pulp prior to precipitation of U_3O_8 ; pH control in water treatment plants; precoat of filters; lime feeding in mineral beneficiation and lime feeding in sugar processing.

VACSEAL IS IDEAL. Never any slurry dilution because gland water is not required... less pump wear because large impeller clearances easily pass the solids... heavy duty construction for longer bearing life... available with replaceable rubber or Neoprene liners or in cast white iron or alloy construction... sizes, 1½" x 2" through 8" x 10".

Complete systems are available including: VACSEAL PUMPS, feeders, agitators, tanks, valves and rubber lined pipe.

Write for suggestions on your problem.

LEADERS IN EXPERIENCE AND SERVICE

the GALIGHER co.

CONSULTATION • PLANT DESIGN • CORROSION ENGINEERING

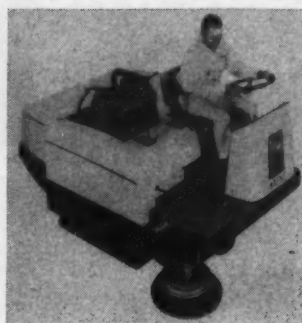
HOME OFFICE: 545 S.W. 8th South
P.O. Box 209
Salt Lake City 10, Utah
EASTERN OFFICE: 921 Bergen Ave.
(Room 1128) Jersey City 6, New Jersey

GALIGHER PRODUCTS: AGITAIR® Flotation Machine, VACSEAL Pump, Geary-Jennings Sampler, Acid-proof Sump Pump, Geary Reagent Feeder, Laboratory AGITAIR® Flotation Machine, Laboratory Pressure Filter, Laboratory Ball Mill, Rubber Lined and Covered Products, Plastic Fabrication.

VP-520

Check 4394 opposite last page

ENGINEERING & SAFETY



Lease power sweeper...

... such as the model pictured above, capable of sweeping dust-free inside or out, in excess of 120,000 sq ft per hour. These sweepers are available without capital expenditure through simplified lease plan. Monthly lease payments are as low as \$150. Sweepers range in size from 30" to 72".

(Power Sweeper Lease Program information may be obtained from Wayne Mfg. Co., 1276 East Lexington Ave., Pomona, Calif.)

Check 4395 opposite last page.

Insures safe transport for one gal bottles of corrosives

Uses: Unit is designed for safe intra-plant transport of one gallon bottles of corrosive chemicals and solvents.

Features: Designed to prevent breakage of bottles, carriers will also contain the contents.

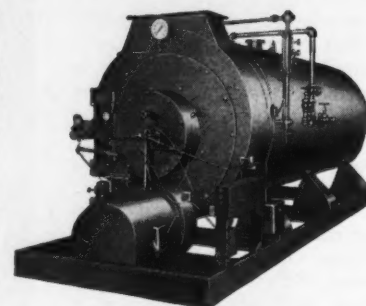
Description: Safety bottle carrier was developed to overcome the objection to the commonly used canvas and leather carriers. Carrier consists of heavy-wall polyethylene container with a plastisol-covered steel bale, secured to integrally molded-on ears. Cover snaps securely on body and holds bottle firmly in place. Drop tests were carried out at heights up to three feet without bottle breakage.

(Nalgene safety bottle carrier is product of the Nalge Co., Inc., 625 South Goodman St., Rochester 20, N.Y.)

Check 4396 opposite last page.

COUNT 'EM!

CYCLOTHERM CUTS STEAM PROCESSING COSTS 3 WAYS!

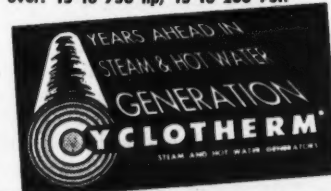


1. FUEL COSTS Cyclotherm Cyclonic Combustion means just what it says — controlled fuel and air, whirling at 200 mph, forming a cyclone in the furnace! This high velocity burning assures maximum efficiency in combustion and heat transfer, resulting in lower fuel consumption.

2. MANPOWER COSTS A fire without a fireman! Electronic controls operate the Cyclotherm safely and automatically. Smaller models cycle on and off as steam is required. On larger models, precision modulation coordinates the fuel-air ratio to the load demand, from 30% to 100% of rated capacity.

3. INSTALLATION AND MAINTENANCE COSTS Cyclotherm is factory assembled and factory pre-tested. All you do is make five simple connections. 50% maintenance savings are not uncommon. Return tubes cleaned in minutes with no removal or replacement of refractories. No standby unit needed.

And remember—one-third smaller than ordinary generators of similar capacity, a Cyclotherm fits almost anywhere. Many plants have installed two Cyclotherms for utmost flexibility and power. Burns gas or oil with quick change-over. 15 to 750 hp, 15 to 200 PSI.



Cyclotherm Division,
National-U. S. Radiator Corp.
61 E. First St., Oswego, N. Y.
Please send me a free copy of your booklet
giving full information on Cyclotherm Steam
and Hot Water Generators.

Name _____
Company _____
Address _____
City _____ Zone _____ State _____

Check 4397 opposite last page

CHEMICAL PROCESSING

THAT'S INTERESTING

Early automation

One of the first developments in automation occurred way back in 1784. Oliver Evans invented a flour mill in which the grain was unloaded from a boat or wagon and processed to finished flour without the aid of human hands.

Some detector!

A scientific apparatus maker has developed a device that can detect holes in vacuum tubes so small it would take 120 years for a thimbleful of air to leak through.

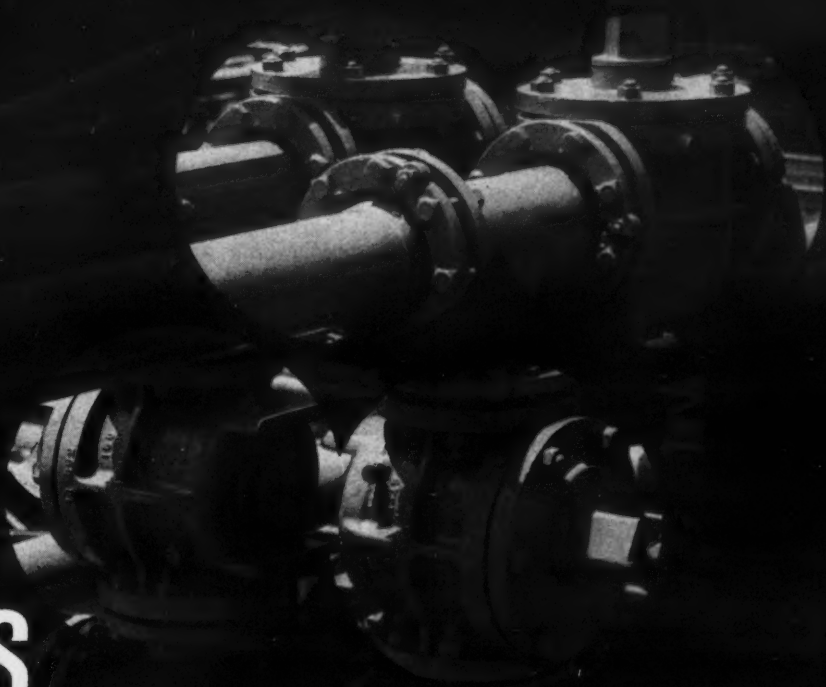
Piston-ring wear

According to tests conducted in Ethyl Corp. research labs, fuel preignition can cause severe piston-ring wear. Discovery was made during radioactive-tracer studies of basic wear mechanisms.

For more information on product at right, specify 4398 see information request blank opposite last page.



IN THE SPOTS THAT COUNT...

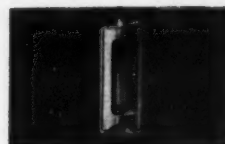


Goodyear specifies Homestead Valves for non-contamination of GR-S latex rubber

Through the round ports of Homestead Lubricated Plug Valves at Goodyear Tire and Rubber Company's synthetic rubber plant in Houston, Texas, flow dilute solutions of GR-S latex rubber at 80 p.s.i. and 100° F.

Fluid solutions never lodge and build up in the line since Homestead Round Port Valves provide full circular opening through plug and body of the valve—same size as the pipe they serve.

A letter or the coupon below will bring you further information on this installation. You may also receive complete details on low first cost, low maintenance, Homestead Valves in our catalog 39-1.



Controlled pressurized lubrication plus extremely close tolerances between plug and body assure lubrication of all sealing surfaces without contamination of line fluids.



HOMESTEAD VALVE MANUFACTURING COMPANY
P. O. Box 140, Coraopolis, Pennsylvania

- ☐ Please send me catalog and prices on Homestead Lubricated Plug Valves.
- ☐ Send more facts about latex applications.

Name.....Title.....

Company.....

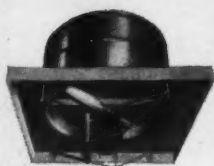
Address.....

City.....Zone.....State.....



Here's one way...

to clear the air of heat, smoke, fumes and other irritating elements. Hartzell roof ventilators do the job more effectively and economically. Send for Bulletin A 112.



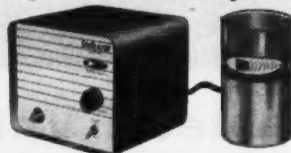
HARTZELL PROPELLER FAN CO.
Div. of Castle Hills Corp.
65 Thomas Blvd., Piqua, Ohio A member of AMCA

Check 4399 opposite last page

NEW! The lowest-cost ultrasonic cleaning and chemical processing unit available anywhere!

narda
SONBLASTER

\$175



Generator G-201

Tank NT-201

Now, no one need put off buying ultrasonic equipment because of cost! Narda's mass production techniques have done it again — this time, a 35-watt unit, complete with stainless steel transducerized tank with tremendous activity, at the lowest price in the industry — and with a 2-year warranty!

Hot lab apparatus, medical instruments, electronic components, optical and technical glassware, timing mechanisms — the Narda SonBlaster cleans 'most any mechanical, electrical or horological part or assembly you can think of — and cleans faster, better and cheaper. It's perfect, too, for brightening, polishing, decontaminating, sterilizing, pickling, deburring, and plating; emulsifying, mixing, impregnating, degassing, and other chemical process applications.

What's more, two tank sizes are available, and there's a duty cycle timer at only \$10 additional. For more information, write to Dept. CP-4.

SPECIFICATIONS

Generator Model No.	Tank Model No.	Interior tank size (in.)	Tank Capacity	Price
G-201	NT-201	4-5/8 deep x 3-5/16 diam.	1/8 gal.	\$175
G-201	NT-202	6-1/2 deep x 4-7/8 diam.	3/8 gal.	\$210

Model G-202 Generator (same as G-201, but with duty cycle timer) available with either tank above, \$10 additional.

The SonBlaster catalog line of ultrasonic cleaning equipment ranges from 35 watts to 2.5 Kw, and includes transducerized tanks as well as immiscible transducers which can be adapted to any size or shape tank you may now be using.



Check 4400 opposite last page

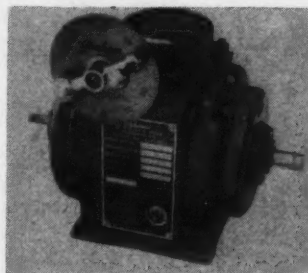
ENGINEERING & SAFETY

Settings to one part in four thousand

Uses: As speed control device.

Features: Unit permits speed setting to one part in four thousand. Improved "anti-backlash" control linkage permits accuracies of speed holding and reset of same order.

Description: Micrometer dial, available as optional



Speed control permits settings to one part in four thousand

equipment on variable speed drives, provides all speeds from any desired maximum to zero — and reverse — with speed adjustable with transmission running or stationary.

(Micrometer dial is available on variable speed drives of Graham Transmissions Inc., Menomonee Falls, Wis.)

Check 4401 opposite last page.

Extrusion development permits large diameter polyethylene pipe

Test data shows new pipe as 50 year life expectancy

Uses: For handling caustic or acid solutions; material has also been approved for potable water installations.

Features: Test data shows pipe compound has useful life expectancy of 50 years at pressure ratings several times higher than conventional material.

Description: Development of extrusion technique and die design to handle ultra-high molecular weight polyethylene resin enables company to take full advantage of excellent

King MANOMETERS

For Plant and Laboratory

King Manometers are rugged, low-cost instruments of unexcelled accuracy for measuring pressure, vacuum, differential pressure, and pressure-related phenomena. They're available in the following types, in a complete range of sizes:

U-Type Manometers

- Single Cleanout
- Double Cleanout
- With 3-Valve Manifold
- Inverted U-Type

Well-Type Manometers

- Low-Well
- Raised-Well
- Barometric-Reading
- Flowmeter Type
- Inclined-Tube

Multi-Tube Manometers

- Individual-Well
- Common-Well
- Photo-Manometers

NEW CATALOG 2008 gives details on these and other models — includes manometer liquids and accessories — explains basic principles. Write —

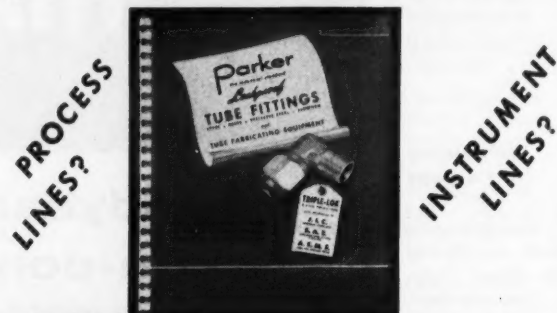


KING ENGINEERING CORP.

Box 270 • Ann Arbor, Mich.

REPRESENTATIVES IN PRINCIPAL CITIES

Check 4402 opposite last page



This 128-page Parker Tube Fittings Selector will help you with your layouts

With the complete Parker Fittings Data Book, you can quickly select the correct type, shapes, alloys and sizes of tube fittings to handle any process or instrument fluid from low-pressure air to high-pressure steam, gases or liquids. Book fully describes all five types of Parker ferrous and non-ferrous Tube Fittings for use on metal or plastic lines from 1/16" to 2" diameter... "Intru-lok," "Triple-lok," "Ferulok," "Weld-lok," "Braze-lok."

For a copy of the Parker 4300 Catalog, call your Parker distributor, listed in the Yellow Pages. Or write to...

Parker FITTINGS AND HOSE DIVISION

17325 Euclid Avenue • Cleveland 12, Ohio

A DIVISION OF PARKER-HANNIFIN CORPORATION

Check 4403 opposite last page

CHEMICAL PROCESSING

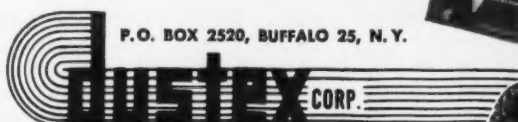
where there's a
**drying
operation**
leading manufacturers * insist
on **DUSTEX
COLLECTORS**

DUSTEX miniature cyclone tubes, cast of white iron, provide an ultra-hard, cling-free, self-cleaning surface to assure maximum material recovery at a constant, high-speed rate.

DUSTEX patented design prevents condensation within the collector when inlet temperature is above the dew point. Handles temperatures up to 800°F. There are no filters to clog, no sludge to pump. It's virtually maintenance free!

LOW INSTALLATION COST and up to 99.8% efficiency make DUSTEX the perfect collector for spray dryer, rotary dryer or flash dryer processes.

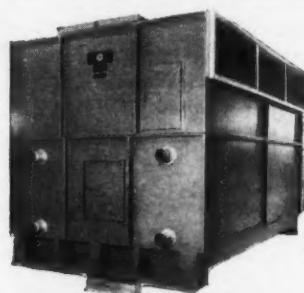
*Name on request
Write today for this free bulletin on the new D-584 DUST COLLECTOR.



P.O. BOX 2520, BUFFALO 25, N. Y.

Check 4404 opposite last page

**This Self-Contained
Fluid Cooling System**
... gives most
accurate temperature
control



Applied in cooling industrial machines or processes to temperatures approaching the ambient wet-bulb, the NIAGARA Aero HEAT EXCHANGER is independent of any more than a nominal water supply or disposal. The coolant system is a closed one, free from dirt and maintenance troubles.

Heat is removed from your process at the rate of input, giving you precisely the temperature you require and assuring the quality of your product. Heat may be added to prevent freezing in winter or

for better control in a warm-up period. Liquids or gases are cooled with equal effectiveness.

Heat is rejected outdoors. Only the little water evaporated on the cooling coils in the air stream, or discharged to prevent hardness build-up, is consumed.

Niagara sectional construction saves you much installation and upkeep expense, gives full access to all interior parts and piping. Your equipment always gives you full capacity and "new plant" efficiency.

Write for Niagara Bulletin No. 132 for complete information

NIAGARA BLOWER COMPANY
Dept. CP-3, 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

Check 4405 opposite last page

ENGINEERING & SAFETY

physical properties of compound.

Polyethylene pipe is now available in 1, 2, 3, 4, 6, and 8 inch diameters. Lengths of 100 and 300 feet are available for



High-density, high molecular weight polyethylene pipe is connected with a Van Stone flange. In many cases no gasket is required and joints have proven strong as pipe itself

one-inch diameter pipe: 100 and 200 feet for two-inch diameter pipe. All other pipe sizes are available in 30-ft sections. Pipe is easily and securely joined by flanging of ends.

(A-C polyethylene pipe is product of Semet-Solvay Petrochemical Div., Allied Chemical Corp., 61 Broadway, New York 6, N. Y.)

Check 4406 opposite last page.

**Line of fitting covers
for low temp pipe**

Uses: As covers for elbows, joints, tees, valves, and other fittings, in range of sizes for all industrial and commercial requirements.

Features: Precision machined to fit all types of low temperature pipe, covers can be engineered with any wall thickness to provide proper insulation.

Description: Fitting covers are machined from expanded polystyrene.

(Fitting covers are product of Glo-Brite Products, 6415 N. California Ave., Chicago 45, Illinois.)

Check 4407 opposite last page.



**FOR SEALING THE UNUSUAL...
DURASEAL**
...provides mechanical sealing for the widest range of pressures, temperatures and speeds
Technical information on request — write DURAMETALLIC CORP., Kalamazoo, Michigan

Check 4408 opposite last page

NOT ONE FIELD CUT

in all This

MIDWEST

Shop-Fabricated

Piping



and I would like to say the West Coast Division have on this job complied fully with the high standards of workmanship for which Midwest is known.

Throughout this entire project not once was a cut necessary to correct any piece of fabrication, and I might add in several instances close tolerances had to be met.

The above was not written on an impulse but as construction superintendent, this means but one thing: fast and low cost erection. Would appreciate your thanking Midwest personally for a job from a construction

Excerpt from letter by:
HOLMES & NARVER • Engineers-Constructors
828 South Figueroa St. • Los Angeles 17

Note particularly the words "fast and low cost erection" in the above letter. They characterize Midwest Shop-Fabricated Piping... whether for refinery, power plant or industrial installations. In this instance they were written by A. H. Chamberlain, construction superintendent, upon completing the installation of a Houdriformer Unit at the U.S. Oil & Refining Co., Tacoma, Washington.

There are three well-equipped Midwest pipe fabricating shops located to serve economically all sections of the country. Each is staffed by a highly skilled organization using the latest techniques. Each has wide experience on all kinds of projects so that the possibilities and limitations of all piping materials are well understood. You too will find it to your advantage to call in Midwest whenever you need fabricated piping.



MIDWEST PIPING COMPANY, INC.

Main Office: St. Louis 3, Missouri (P. O. Box 433)
Plants: St. Louis, Clifton, N. J. and Los Angeles

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• TULSA—1640 E. 21ST ST.

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Do you know that the magazine can come to you personally without charge, to your designated address?

If you...

would like to receive it and if you qualify, the publisher will add your name to the more than 50,000 key men in the chemical processing industries who receive each issue regularly.

The necessary qualifications are outlined on the request form that can be found opposite the inside back cover.

Fill it out, being sure to give all necessary information, and mail to Reader Service Department.

Perhaps...

others in your company would also like to receive **CHEMICAL PROCESSING** personally each month. Include their names on the form opposite the back cover.

Your application for subscription is welcomed.

For more information on product at left, specify 4409 see information request blank opposite last page.



ONLY ERIEZ

has a complete line of
permanent non-electric
GRATE MAGNETS
designed to specifically

**STOP
TRAMP IRON
and
IRON FINES**



ONLY ERIEZ Grate Magnets offer the widest selection of models, sizes and construction in the widest price range... either strong, proved-in-use ALNICO magnetic elements or new, low-cost CERAMIC material.

ONLY ERIEZ has units designed for your exact needs — with the most effective, most powerful magnetic fields — protected by U. S. and foreign patents.

ONLY ERIEZ — world's leading producer of magnetic equipment for industry — has the experience and know-how to provide the most effective Grate Magnets:

For tramp iron separation — Eriez Alnico-powered Grate Magnets proved stronger than all comparable units in extensive, controlled tests. Alnico is also highly effective for fine-iron separation.

For fine-iron separation — Eriez Ceramic Grate Magnets proved best for efficient, economical removal of fine-iron in free-flowing materials.

All Eriez Grate Magnets are non-electric, self-contained. Operate without any wires or attachments. Designed to prevent choking possibilities caused by bridging of iron and material accumulation. First cost is only cost. Ruggedly constructed; magnetic tubes permanently secured to frame, can't fall into flow line. No operating or maintenance costs. Available in: Wing-Type, Drawer-Type, Multiple-Bank, Rotary-Type, Odd-shaped Models, Housed Units, and Housed Vibratory Units.

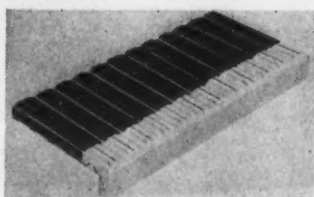
Get all the facts... Write today
Eriez Mfg. Co., 73-QB Magnet Dr., Erie, Pa.



Check 4410 opposite last page

MARCH 1959

ENGINEERING & SAFETY



Slips, fall prevented...

... through non-skid anti-slip features of metal-backed safety step tread. Lip and edge contain high percentage of live rubber that helps prevent shattered shinbone accidents and withstands gouging action of sharp heels. Tread is made from synthetic rubber compound that resists heavy abrasion.

Small squeegee ribs grip shoe soles tightly while water tracked onto the step tread quickly drains off through deep grooves. Step plate is full 5/16" thick. Depth of standard step tread — measured from inside of metal backing to back of step — is 9, 10, or 11". Width of step tread is in 1" increments up to maximum of 72" in all-black, or to 36" with white safety step edge.

(Rub-Bub step plate is product of Flooring Products Div., Samuel Moore & Co., Mantua, Ohio.)

Check 4411 opposite last page.



"Could Fred's assistant take over a few days as safety supervisor, Mr. Benson? ... Fred caught a bad cold working in the basement."

Pumps pulpy mixtures containing solids and abrasives

Uses: As heavy-duty low-speed slurry pump.

Features: Unit is designed especially to handle fluids containing random size solids and highly abrasive materials.

Description: Heavy-duty, low-speed centrifugal pump is suitable for dredging as well as slurries comprised of sand, coal, tailings, gravel, lime, process wastes, and other abrasive or pulpy mixtures.

Pump is available in five sizes: 4-, 6-, 8-, 10- and 12-inch. It is constructed of highly abrasive-resistant metals: semi-steel, ni-hard, cast steel or manganese steel.

(Type CK Solids Pump is product of Morris Machine Works, Baldwinsville, N. Y.)

Check 4412 opposite last page.

Liquid weighing unit prevents hazards of fire, explosion

Uses: For measuring liquid by weight rather than by volume.

Features: Weigh tank is completely shrouded with weigh beam entering shroud through sealed diaphragm. Shroud is provided with fittings for nitrogen purge.

Description: Automatic liquid weighing unit has range of 1 oz to 10 lb. It has an output of up to 10 weighings per minute. Pneumatic or electrical controls are available for semi-automatic or fully automatic operation. All contact parts are stainless steel.

(Automatic liquid weighing unit is product of Glengarry Processes Inc., Bay Shore, New York.)

Check 4413 opposite last page.

Acrylic emulsion paint formulations and exposure test data are given in 60-page book containing a wealth of tables and photos. "Progress Report 5" — Rohm & Haas Company, Washington Square, Philadelphia 5, Pa.

Check 4414 opposite last page.

ERIEZ

**ALL NEW
"Series 16" permanent
PLATE
MAGNETS
are**



Tests prove NEW "Series 16" magnets with greater magnetic strength stop tramp iron cold! New heavy duty aluminum cover increases rigidity, prevents pilferage and disassembly with subsequent loss of magnetic power. Choose from many models and strengths... optional face plates for abrasive, corrosive or sanitary uses; liquid or dust-tight applications. It's a fact: "Series 16" magnets, with 16 superior features, provide ultimate operating advantages at price of ordinary magnets!

GET 6-PAGE FACT-FILLED FOLDER. WRITE TO
Eriez Mfg. Co., 73-QA Magnet Dr., Erie, Pa.



Check 4415 opposite last page

175



TEMP-R-TAPE®

pressure-sensitive TEFLON® tapes
for Class H & C Insulation,
non-stick or chemical resistant facing

Temp-R-Tapes, Teflon with a silicone polymer adhesive, provide dielectric strength up to 2750 v/m, low power factor, a temperature range of -100°F to 500°F (-75°C to 250°C) and a slippery, low friction or chemical resistant surface. Easy-to-apply, just press in place. Temp-R-Tapes are "called out" for many electrical and electronic insulating applications, aircraft and general industrial mechanical applications. 1/4" to 12" wide, .002" to .013" thick. From stock.

* du Pont T.M.

FREE SAMPLE and data . . . write, phone or use inquiry service.

A PRODUCT OF **CHR** THE CONNECTICUT HARD RUBBER CO., NEW HAVEN 9, CONN.

Check 4416 opposite last page



HERE'S THE MOST COMPLETE NOZZLE CATALOG EVER PUBLISHED

Whatever your nozzle problem, look first in this new catalog by Spraco. Here is complete information on a wide range of nozzle types and sizes as well as general spraying coverage data.

Send for your **FREE** copy today . . .

SPRAY
Engineering Company



Check 4417 opposite last page

ENGINEERING & SAFETY



Convert used drums . . .

. . . to safe waste containers by using kit consisting of fire-resistant heavy steel lid containing two free swinging doors with rust-proof baked green enamel finish. Lid can be easily attached in a few seconds to any standard drum.

Kit also includes can of instant-dry spray-on to spruce up unattractive drums, and burlap bag that hooks conveniently inside drum to prevent corrosive action of waste and facilitate disposal.

(Convert-A-Drum swing-top lids, separately or with kit, are available from General Scientific Equipment Co., Limekiln Pike and Williams Ave., Philadelphia, Pa.)

Check 4418 opposite last page.

Variable-speed drive simple in operation, maintenance

Uses: Unit is designed especially for agitator and mixer duty.

Features: Many advantages are offered in applications where variations may exist in temperature, viscosity, batches, or raw materials. Unit is also useful in pilot production to determine the exact speed required before constant-speed motor is installed.

Description: Packaged variable-speed drive is simple in operation and maintenance. It contains no electronic or DC components and connects to any 3-phase AC power source.

High-speed AC motor, mechanical variable-speed transmission, and double-reduction gearing are combined in single integrated unit. Methods of speed control available are: handwheel on unit, remote mechanical, remote electrical,



MAISCH

METERING PUMPS

- COMPLETELY SANITARY, STAINLESS STEEL CONSTRUCTION.
- POSITIVE DISPLACEMENT—SMOOTH, UNIFORM, NON-PULSATING FLOW.
- PUMP HEADS DEMOUNTABLE WITHOUT TOOLS . . . FOR INSPECTION, CLEANING AND STERILIZING.
- DISPENSE BOILING-HOT OR ICE-COLD WATERY LIQUIDS OR HIGHLY VISCOUS FLUIDS.

Maisch Metering Pumps are simple in design, ruggedly built for long service, and can be depended on to maintain accuracy indefinitely. Exclusive design features insure optimum performance. Particularly suited for handling chemicals, syrups, oils, glue, processing solutions, etc. Quick demountable or fixed heads. Fixed capacity pumps available in wide range of output. Pumps in stock for immediate delivery. Write for complete details and prices.

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Check 4419 opposite last page

HEATING PROCESS?

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MATERIAL and EQUIPMENT

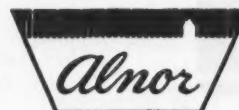
Automatically

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Not expensive...but a simple, automatic way to safeguard your investment in heating equipment and materials in process.

The precision-built Pyrotac constantly indicates temperature of the heated equipment and sounds an alarm and/or shuts down the equipment at a safe, preset temperature. May also be used as a controller on processes where shutdown is required upon reaching final process temperature—such as ceramic kilns, molds, etc. Automatic thermocouple break protection assures complete safety if couple or lead wire should break.

Write for Pyrotac bulletin. Attach this ad to your letterhead, send to: Alnor, Room 504, 420 No. LaSalle St., Chicago 10, Ill.



**PRECISION INSTRUMENTS
FOR EVERY INDUSTRY**

Check 4420 opposite last page

CHEMICAL PROCESSING

or Varitrol Automatic Control. With automatic control, speed of drive can be automatically adjusted to meet any change in viscosity of material being mixed.

Horsepower range from 3 to 30 with speed variations ranging from 2:1 to 7:1 are available. Rpm range is from 30 to 380.

(Vertical Varidrive-Syncro-gear is product of U.S. Electrical Motors, Inc., Box 2058 Terminal Annex, Los Angeles 54, California.)

Check 4421 opposite last page.

Lightweight respirator has more filter area longer filter life

Uses: For protection against dusts, pneumoconiosis-producing mists, and chromic acid mists.

Features: Weight of unit is approximately half that of comparable devices. Respirator design provides greater functioning filter area which increases filter life.

Description: Plastic respirator is constructed of modified polyethylene material that is nontoxic, resilient, and durable. Frame cushion-fits wide variety of face shapes and head sizes. Double headbands have four-point suspension providing positive seal with minimum pressure.

Filter is treated-wool electrostatic type. Valve construction and location reduce inhalation and exhalation resistance. Weight of unit is only 2.1 ounces.

(Air-Raider respirator is product of Welsh Mfg. Co., 28 Magnolia St., Providence 9, Rhode Island.)

Check 4422 opposite last page.

Skylight products of aluminum and Fiberglas are listed in 1959 issue of catalog which consolidates information of all previously issued literature in one booklet. Twelve-page brochure covers all models and designs. "Marcolite® Skylights" — The Marco Company, 45 Greenwood Ave., East Orange, N. J.

Check 4423 opposite last page.

POWELL NICKEL and MONEL* VALVES for Chemical and Process Industries

We have produced a wide line of NICKEL and MONEL* METAL VALVES. All are ready for immediate delivery!

When your flow control requirements call for Nickel or Monel* Metal Valves your local Powell Valve Distributor is the man to see. There's one located in all principal cities. Or write to us for complete information.

THE WM. POWELL COMPANY
Cincinnati 22, Ohio
dependable valves since 1846

*Registered Trade Name of The International Nickel Co.

Fig. 2108—Monel or Nickel "Y" Valve for 150 pounds W.P. Outside screw rising stem and yoke. Screwed ends. Flanged end or socket welding end valves can be supplied.

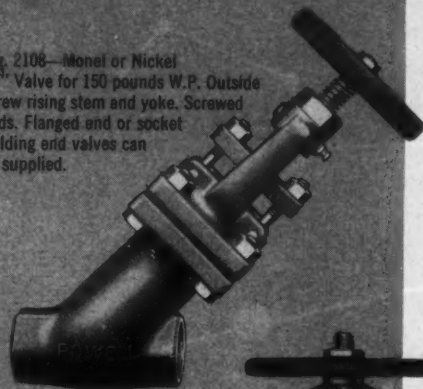


Fig. 2453 SG—Large size O.S. & Y. Gate Valve for 150 pounds W.P. Solid wedge disc. Can also be furnished with split wedge disc. Dimensions conform to latest standards.

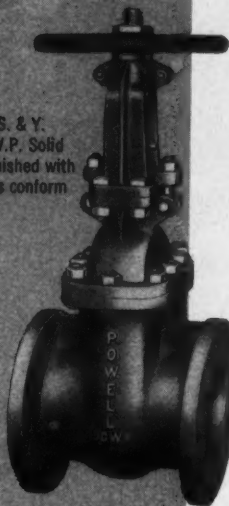


Fig. 1836—Monel Metal Fig. 1839—Nickel Small Union Bonnet Globe Valve for 200 pounds W.P. Available with screwed, flanged or welding ends; also in angle pattern.

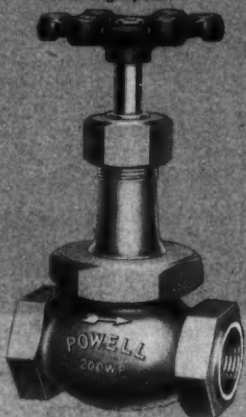


Fig. 1843—Monel Metal. Fig. 1845—Nickel. Small size Check Valve for 200 pounds W.P. Screwed-in cap. Has straightway flow area through valve body when disc is in wide open position. Can also be supplied with flanged or socket weld ends.

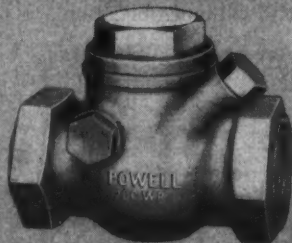


Fig. 2493—Bolted flanged bonnet Gate Valve for 150 pounds W.P. Outside screw stem rises through revolving bushing in upper yoke. Interchangeable solid or split wedge discs. Screwed or socket weld end valves also available.

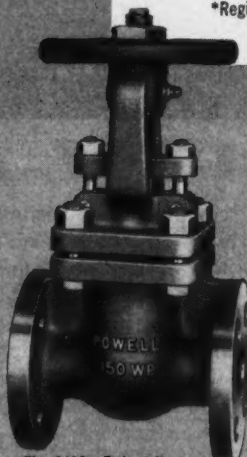


Fig. 1828—Monel Metal Fig. 1830—Nickel Inside screw rising stem Gate Valve for 200 pounds W.P. Accurately guided solid wedge disc. Also available with flanged or socket weld ends.

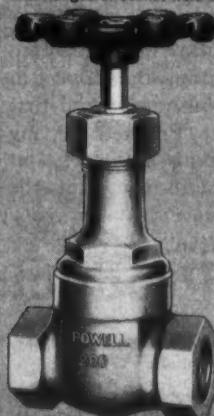
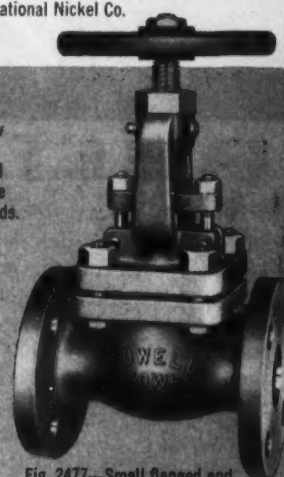
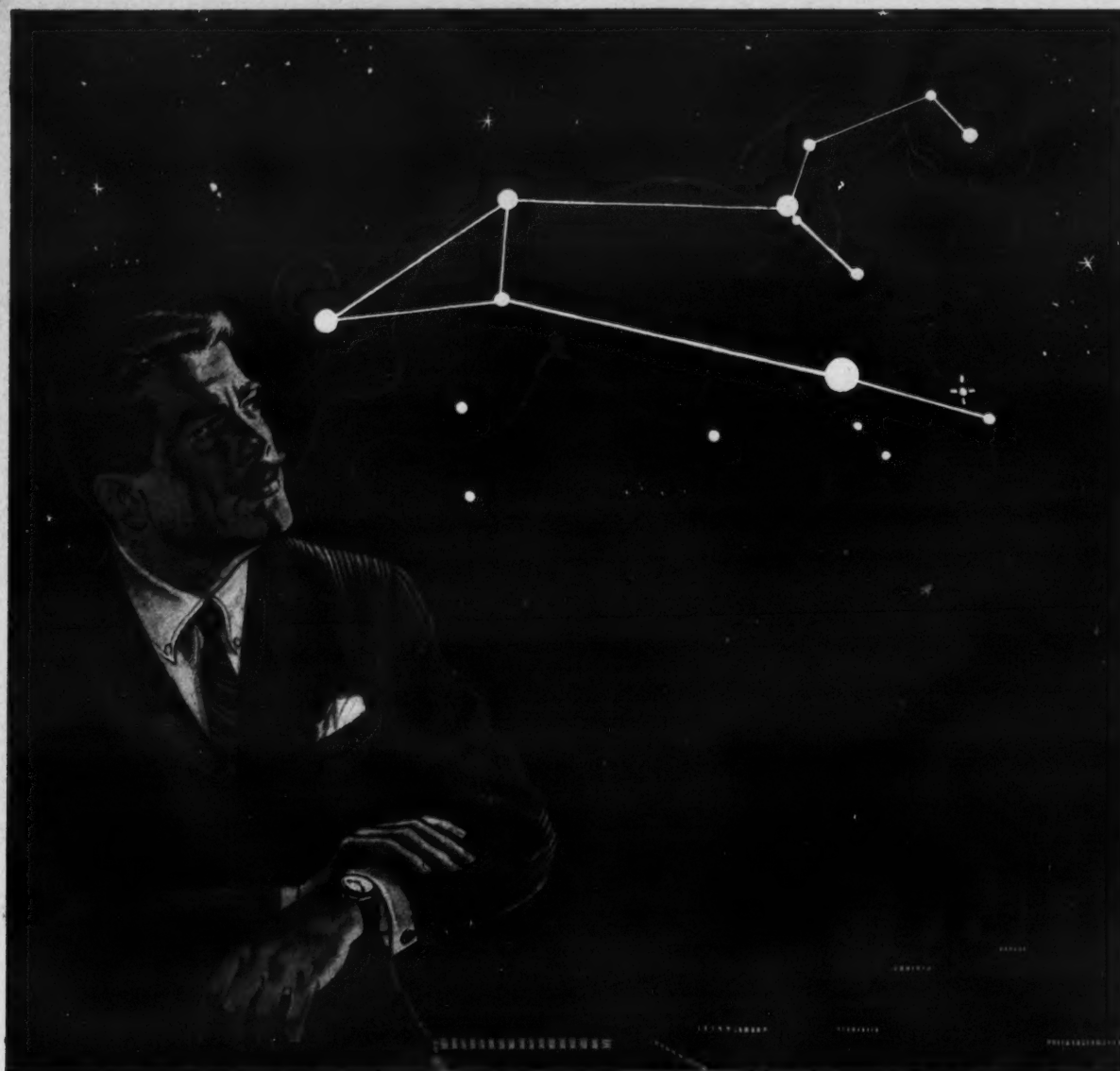


Fig. 2477—Small flanged end, outside screw rising stem and yoke Globe Valve for 150 pounds W.P. Bolted flanged bonnet. Can be furnished with screwed or socket weld ends. Angle Valves available.



Check 4424 opposite last page



RELIABILITY...

Because the movement of the stars never varies, an astronomer can determine time to the exact second by checking the position of Leo, Orion, or one of the other constellations that appear in the night skies. That's *reliability* — a word that has become a motto for Mikro-Products. Serving the rapidly growing processing industries, our reputation rides on the performance of the

equipment we manufacture . . . good reason why our standards are high . . . good reason why Mikro grinding, conveying and dust collection units are built to put greater efficiency and economy into our customers' operations. If you'd like to know more about Mikro-Products . . . about Mikro quality and reliability, the information is yours on request, and without obligation.

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PROCESSING SYSTEMS



GRINDING CONVEYING COLLECTING

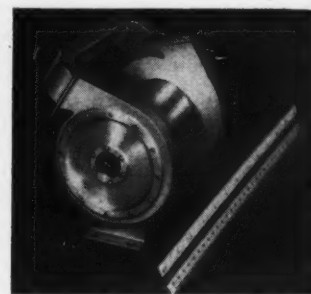
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ENGINEERING & SAFETY

High efficiency, pressures can be obtained with compact blower

Uses: For supplying air in industrial applications with flow in range of 7 to 20 cfm.

Features: Unit has high efficiency at extremely low flows. For example, at 7 cfm efficiencies run higher than 60%. Units also have high pressures, up to 110' of water, and are very compact.



Compact miniature blower develops 55" of water pressure with flow in range of 7 to 20 cfm.

Description: Low-flow centrifugal blower has overall width of 4", overall length of 5½", and a weight of only 2½ lb, including motor. A 1/10-hp, 400-cycle AC or 12 and/or 24-volt DC motor drives the twin blowers.

(Series 300 blowers are product of Sawyer-Bailey Corp., 1559 Niagara St., Buffalo 13, New York.)

Check 4426 opposite last page.

Flexible hose assemblies of Teflon, complete with end fittings, are described in 16-page, two-color, well illustrated brochure. Diagrams and specification tables are included. Bul TC-101 — American Metal Hose Div., The American Brass Company, Ambrac Bldg., Waterbury 20, Conn. Check 4427 opposite last page.

Metering gear pump which has capacities up to 3 gpm is discussed in technical bulletin with pressure and capacity curves and dimensions. Service ratings and recommendations also are covered. Tech Bul on Series 700 pump — Eco Engineering Company, 12 New York Ave., Newark 1, N. J. Check 4428 opposite last page.

CHEMICAL PROCESSING



new literature

Industrial bulletins pertinent to the reader . . . offering data on products, processes, services. Additional reviews of catalogs, bulletins, data sheet, etc., are found throughout other sections of this magazine

Portable conveyors for use in movement and recovery of such materials as rock granules, plastic pellets, and gritty or pulverized substances are described in four-page Bul PB502—Air Appliance Div., U. S. Hoffman Machinery Corp., 103 Fourth Ave., New York 3, N. Y.

Check 4429 opposite last page.

Pneumatic material handling systems that can be designed and engineered for specific applications are described and illustrated in company literature. Fuller Company, subs. of General American Transportation Corp., 136 Bridge St., Catasauqua, Pa.

Check 4430 opposite last page.

Walkie-type truck suitable for highly congested areas, short hauls, or intermittent operations is featured in 16-page booklet. Applications, photographs, custom-built specials, standard specifications, and attachments are presented. "Transporter Facts and Factors"—Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.

Check 4431 opposite last page.

Polypropylene applications and its future role, and polyethylene use in radioisotope laboratories are covered in latest issue of eight-page booklet. Vol 4, No 7 "Plastics Welder and Fabricator"—American Agile Corp., PO Box 168, Bedford, Ohio.

Check 4432 opposite last page.

Aeration ejectors for use in biological oxidation waste treatment processes are discussed in 4-page bulletin. "Penberthy Aeration Ejectors"—Penberthy Manufacturing Co., 1242 Holden Ave., Detroit 2, Michigan.

Check 4433 opposite last page.

Urethane foams—formulations and requirements for foamed-in-place applications are subject of 6-page booklet. Uses for the foams are also mentioned. Chemical Sales, National Aniline Division, 40 Rector St., New York 6, New York.

Check 4434 opposite last page.

Boltless steel shelving for fast installation, easy rearrangement, high strength and rigidity is covered in eight-page booklet. Bul B-40—Penco Div., Alan Wood Steel Co., 200 Brower Ave., Oaks, Pennsylvania.

Check 4435 opposite last page.

Punch-card control for batch or continuous flow system is covered in two-page Bul J.200—Jordan Co., Inc., 3235 W. Hampton Ave., Milwaukee 9, Wis.

Check 4436 opposite last page.

Moisture analyzers for corn, corn gluten, and meal of various types are described in three-page report. Calibration curves are included. "Material Study Report 21.58"—Schlumberger Well Surveying Corp., Ridgefield Instrumentation Div., Ridgefield, Conn.

Check 4437 opposite last page.

Fiber cartridge filters used for full-flow filtration of all types of fluids are presented in 12-page catalog. Line drawings and pictures illustrate various models. Cat No. 53-101—Department 53, The Cuno Engineering Corporation, 4627 South Vine St., Meriden, Conn.

Check 4438 opposite last page.

Engineering services and capabilities of a company which has participated in large number of major nuclear reactor projects in U. S. and abroad are described in eight-page engineering brochure. "Development and Engineering Nuclear Fuels and Components"—Sylvania-Corning Nuclear Corporation, Bayside, N. Y.

Check 4439 opposite last page.

Cable-support systems to hold power and control cables and instrument pipe are depicted in 78-page catalog which includes specifications and sample-layout diagrams. Cat 858—P-W Industries, Inc., Duncan & Melrose Streets, Philadelphia 24, Pa.

Check 4440 opposite last page.

Industrial chemicals—Properties of intermediates, solvents and plasticizers are listed in 6-page bulletin. Several new products appear. "Celanese Product Index"—Chemical Div., Celanese Corp. of America, 180 Madison Ave., New York 16, N. Y.

Check 4441 opposite last page.

Meter relays—all-purpose electric controls, which can be used in applications involving thickness, torque, current, voltage, radiation, pressure, viscosity, pH, light, speed, load, are described in 12-page bul. System diagrams are given. Bul 106-B—Assembly Products Inc., 75 Wilson Mills Rd., Chesterland, Ohio.

Check 4442 opposite last page.

Chemical engineering research facilities are described in 8-page brochure. Services which are available are outlined and photographs illustrate equipment used on typical projects. "Chemical Engineering Research"—Armour Research Foundation of Illinois Institute of Technology, Technology Center, 10 West 35th St., Chicago 16, Illinois.

Check 4443 opposite last page.

Copolymerization processes of methacrylates with alkyd resins is subject of 6-page bulletin. Formulations, mechanisms, and reaction data are included. "The Methacrylation of Alkyd Resins"—Special Products Dept., Rohm & Haas Co., Washington Square, Philadelphia 5, Pa.

Check 4444 opposite last page.

Automatic weigher and filler for packaging of free- and non-free-flowing materials is discussed in bulletin that tells how bench model machine operates to increase efficiency of small-scale weighing and packaging operations. Specifications and component parts are listed. Bul H-1—Richardson Scale Co., Van Houten Ave., Clifton, N.J.

Check 4445 opposite last page.

Aerosol valve technical data on company's model B-8, B-9, and B-18 units are given in specification forms that list component materials and discharge amounts. Specification forms B-8, B-9, and B-18—Valve Corp. of America, Inc., 1722 Fairfield Ave., Bridgeport, Conn.

Check 4446 opposite last page.

Digital clock with three independent outputs each resolved to one second is technically detailed in two-page Bul 8-41—Panellit, Inc., 7401 Hamlin Ave., Skokie, Ill.

Check 4447 opposite last page.

Dry fluid drives and couplings contained in an expanded line are described in 24-page bulletin, complete with product photographs and engineering drawings. Bul A-640B—Dodge Manufacturing Corporation, Mishawaka, Ind.

Check 4448 opposite last page.

Flow meters for laboratory use are described in Spec Buls 10A10-17 and 10A1027—Fischer & Porter Company, 813 Jacksonville Rd., Hatboro, Pa.

Check 4449 opposite last page.

Filter leaves and their effect on filtration process are discussed in 4-page brochure. Bul 583—Multi-Metal Wire Cloth Company, Inc., 1350 Garrison Ave., New York 59, New York.

Check 4450 opposite last page.

Electronic recorder-controller with full-scale spans as narrow as 5°F is discussed in company bulletin that provides information on electronic equipment for close control. Bul 20-10—The Foxboro Company, 813 Norfolk St., Foxboro, Mass.

Check 4451 opposite last page.

Floodlights of various types and ordering information are contained in 14-section, 184-page catalog. Book features four-color divider sheets, revamped page styling, and several new sections. Each divider sheet has individual table of contents for that section. Floodlight Cat 320—Crouse-Hinds Company, Syracuse 1, New York.

Check 4452 opposite last page.

Impervious graphite products—Four-page illustrated bulletin discusses wide range of equipment for chemical processing. Cat Sec S-5008—National Carbon Co., Div. Union Carbide Corp., 535 Fifth Ave., New York 17, N. Y.

Check 4453 opposite last page.

Wire stitching by flat and arcuate method is detailed in 28-page book. Box stitching, bagging, labeling, and metal stitching are shown in typical applications. "Wire Stitching"—Acme Steel Co., 135th St. & Perry Ave., Chicago 27, Ill.

Check 4454 opposite last page.

Ultrasonics is subject of new house organ. Questions concerning ultrasonic equipment are invited and technical assistance is offered. "Branson Ultrasonic News"—Branson Ultrasonic Corp., 40 Brown House Rd., Stamford, Conn.

Check 4455 opposite last page.

Quality control procedures used by plastics manufacturer to insure top-quality product are outlined in colorful 20-page booklet. "Quality Control—A Company's Conscience at Work"—Eastman Chemical Products, Inc., Eastman Kodak Company, Inc., Kingsport, Tenn.

Check 4456 opposite last page.

NEW LITERATURE

Cable conveyors that can be customized into overhead trolley systems are fully illustrated in four-page Bul 40A—E. W. Buschman Co., Clifton & Spring Grove Aves., Cincinnati 32, Ohio.
Check 4457 opposite last page.

Simplified lift truck operation through single-pedal-operated power transmission is highlighted in company's six-page foldout. Schematic graphically illustrates operation of transmission. Form 3547—Towmotor Corp., 1226 East 152nd St., Cleveland 10, Ohio
Check 4458 opposite last page.

Flow meter suitable for measuring flow rates as high as 4360 gpm is described in two-page Spec Bul 10A1156—Fischer & Porter Co., 819 Jacksonville Rd., Hatboro, Pa.
Check 4459 opposite last page.

Polyvinyl acetate emulsions, solutions, and dispersions are discussed in series of seven data sheets. Features and suggested uses are listed. Polyco data sheets—Polyco-Monomer Dept., Borden Chemical Co., 350 Madison Ave., New York 17, N.Y.
Check 4460 opposite last page.

Sprinkler system containing a head which is combination foam and water nozzle is described in 45-page report. System, which performs as a normal water sprinkler head without foam solution, is designed for fire hazards involving flammable liquids. PB 131740 may be obtained by remitting \$1.25 to the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

Transducers specifically designed for measurement of single or bi-directional flow are covered in four-page brochure. Featured is discussion of unique operating principle, using cross-section drawing, chart, and technical data. Mark V Brochure—Ramapo Instrument Co., 8 First St., Bloomingtondale, N.J.
Check 4461 opposite last page.

Saw tooth crusher designed for handling warm plastic stock and other materials is discussed in 2-page bulletin. Data sheet 204—Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa.
Check 4462 opposite last page.

Hydrazine product specially designed for boiler feedwater treatment is discussed in four-page Tech Bul 589—Betz Laboratories, Inc., Gillingham and Worth Sts., Philadelphia 24, Pa.
Check 4463 opposite last page.

Control air pollution with the aid of company brochure that tells how to clean up combustible pollutants, fumes, and odors from your processes. Facts and figures are given on typical catalytic oxidation industrial installations. "Oxycat Systems"—Oxy-Catalyst, Inc., Wayne 7, Pa.
Check 4464 opposite last page.

Low DC potentials can be read easily by means of precision chopper inverter. Detailed instrumentation and circuit design applications are offered in nine-page brochure. "Low Level DC Measurements"—Microdyne, 300 W. Washington, Chicago 6, Ill.
Check 4465 opposite last page.

Slings which are cable-laid and rope-laid are cataloged in four-page bulletin which gives specifications, load ratings, and standard fittings. Safe-Guard Sling Bul 5886—MacWhyte Company, Fabricated Products, 2905 14th Ave., Kenosha, Wis.
Check 4466 opposite last page.

Resin-treated clays used as fillers in reinforced plastics are discussed in 10-page bulletin. Bul TSBT-84—Technical Service Department, Georgia Kaolin Co., 21 Parker Road, Elizabeth 3, N. J.
Check 4467 opposite last page.

Dispersion mills for processing various wet and dry products are detailed in 6-page brochure. Cat 58—Tri-Homo Corp., Salem, Massachusetts.
Check 4468 opposite last page.

Glassed-steel reactors and their ability to resist thermal shock are discussed in 8-page bulletin. Bul 960—Advertising Dept., The Pfaunder Co., 1079 West Ave., Rochester 3, New York.
Check 4469 opposite last page.

Truck cranes of 15-, 25-, 35-, and 45-ton lift capacity are shown in four-page bulletin that contains brief comments on each type. Rubber-mounted crane bul—Koehring Div., Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis.
Check 4470 opposite last page.

Aerosol loading and contract packaging facilities for waxes, dyes, polishes, and cleaners are depicted in 22-page booklet. "The Stallfort Story"—John C. Stallfort & Sons, Inc., 319 W. Pratt St., Baltimore 1, Md.
Check 4471 opposite last page.

Water equivalents and data and information on estimated water requirements for steam generation, refrigeration, and cooling are contained on plastic wallet-size cards available from Industrial Chemicals, Inc., 2215 South Main St., South Bend 14, Ind.
Check 4472 opposite last page.

Analog-to-digital converters are presented in four-page brochure providing design information, photographs and drawings of equipment and functions. Sheet D1.03—Data Instruments Div., Telecomputing Corp., 12838 Saticoy St., N. Hollywood, Calif.
Check 4473 opposite last page.

Permanent plate magnets are described in six-page folder that lists 16 features such as heavy-duty aluminum cover, greater magnetic strength, and optional face plates for abrasive, corrosive, or sanitary uses. "Series 16" folder—Eriez Mfg. Co., 73-QA Magnet Dr., Erie, Pa.
Check 4474 opposite last page.

Dictionary of scale terms and definitions contains 1170 terms peculiar to scales and weighing. "Terms and Definitions for the Weighing Industry" may be obtained from your scale manufacturer, or by sending \$1 direct to Scale Manufacturers Association, Inc., One Thomas Circle, Washington 5, D. C.

Epoxy-based adhesives, cements, and sealants are discussed in 14-page brochure. Physical and electrical properties plus uses are presented. "Eccobond Adhesives"—Emerson & Cuming, Inc., 869 Washington St., Canton, Mass.
Check 4475 opposite last page.

Metal-tube rotameters for measuring flow rate of hazardous and high-pressure fluids to temperatures of 400°F are described in four-page Bul 19A—Schutte & Koerting Co., Instruments Div., Cornwells Heights, Bucks County, Pennsylvania.
Check 4476 opposite last page.

Data-handling systems said to present a new concept for logging, monitoring, and integration of process information are presented in Bul MSP-154—Kybernetes Div., Hagan Chemicals & Controls, Inc., Box 1346, Pittsburgh 30, Pa.
Check 4477 opposite last page.

Automatic control for engines and compressors is described and illustrated in 14-page Bul 87—Cooper-Bessemer Corp., Mt. Vernon, Ohio.
Check 4478 opposite last page.

Rotary batch mixers suitable for accurate, low cost blending of various materials are subject of 4-page folder. "Rotary Batch Mixer"—Munson Mill Machinery Co., Utica, New York.
Check 4479 opposite last page.

Mechanical-convection ovens with range to 1000°F are featured in two-page bulletin giving performance data, dimensions, construction details. Bul 300—Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill.
Check 4480 opposite last page.



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Check 4481 opposite last page

MARCH 1959

NEW LITERATURE

Packaged power conveyor units, stationary and portable, for either horizontal or inclined conveying, are illustrated and described in company catalog. Cross-sections and dimension charts are included in "Fergo"-Veyor Cat — Harry J. Ferguson Co., Jenkintown, Pa.

Check 4482 opposite last page.

Chromatograph controller is described in bulletin. Specifications and mounting dimensions are listed for the multi-stream, multi-component controller. Bul GC-4117 — Beckman/Scientific and Process Instruments Division, 2500 Fullerton Road, Fullerton, Calif.

Check 4483 opposite last page.

Silicone resin capable of reacting with variety of organic resins and monomers to improve their heat-stability, moisture, and weather resistance is subject of 16-page bulletin. Series of data sheets on silicone — Dow Corning Corp., Midland, Mich.

Check 4484 opposite last page.

For more information on develop-
ments reported in this section,
check corresponding numbers on
Reader Service Slip opposite last
page of this issue.

Packaged sewage plant — capable of serving needs of up to 165-employee plant is subject of 4-page bulletin. Bul 101 — Yeomans Brothers Company, 1999 North Ruby St., Melrose Park, Illinois.

Check 4485 opposite last page.

Automatic gas drying unit that can be timed to meet your program and provide drying on continuous basis is explained in detail. Engineering and installation information is also contained in Bul D-102—The C. M. Kemp Mfg. Co., 405 E. Oliver St., Baltimore 2, Md.

Check 4486 opposite last page.

Molding machines for high-bulk thermosetting materials are topic of 16-page catalog. Specifications and diagrams are included in "Hydraulic Presses & Preformers" — Logan Hydraulics, Inc., 4901 West Lawrence Ave., Chicago 30, Ill.

Check 4487 opposite last page.

Fatty nitrogen derivatives are subject of bulletin. Specifications on five groups of the cationic chemicals are listed. Fatty nitrogen derivative bul — Chemical Division, General Mills, Kankakee, Ill.

Check 4488 opposite last page.

DAY

DUST CONTROL NEWS

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You can save time when planning and save money when buying if you'll send for these DAY dust control bulletins. Each contains valuable information about dust control equipment and systems. Here's general information plus useful technical data and specifications. Ask for any bulletin which interests you or write for them all—they're free. Use this magazine's reader service card or write direct to DAY.



BULLETIN G-579 — Describes the DAY Type "R" filter. An all-purpose, versatile unit. Bulletin gives operating features, dimensions and specifications.

BULLETIN 573 — Dual-Clone dust separators — noted for their low resistance and high cleaning efficiency. Easy to install, no maintenance, no moving parts.

BULLETIN 576 — "HV" heavy duty dust separator. Rugged construction and lower initial cost than many light gauge galvanized type cyclones.

BULLETIN F-75 — Reverse Jet Dust Filter Facts. Complete with specifications, typical equipment layouts, capacity and performance tables for DAY type "AC" filter.

BULLETIN N-578 — Gives complete information about Style "A" rotary valves. Construction features, specifications, dimensions and applications.

"SCHLITZ DEFEATS DUST" — FOOD ENGINEERING magazine reprint describes all out dust control for 3½ million bushel Schlitz grain elevator. Request Bulletin "Schlitz Defeats Dust."

"EFFICIENT DUST SNATCHERS" — Bulletin describes DAY's part in providing maximum safety and good housekeeping for starch packing building of large food processor.

BULLETIN S10 — DAY Unit Dust Collectors. Complete, low cost unit designed for plants or applications where central dust control systems are not practical.

BULLETIN I-585 — Industrial Fans. Complete with helpful selection charts, capacity tables, dimensions and specifications. Information on special types and arrangements included.

The DAY Company

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852 Third Avenue N.E.
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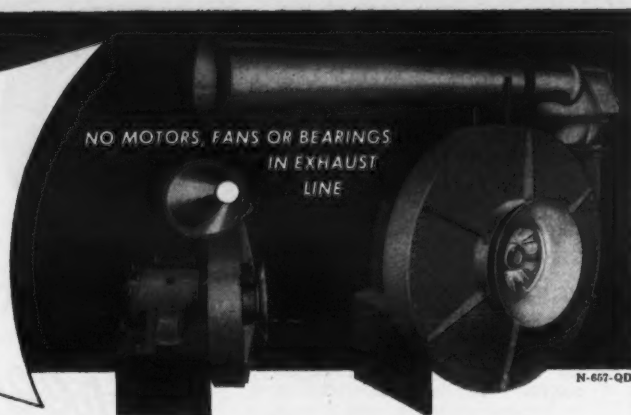
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Check 4489 opposite last page

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**you can reduce
bulk materials
handling costs
with *Quickdraft*
high pressure exhausters**



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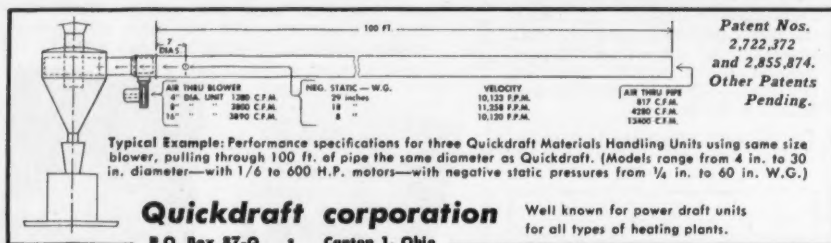
Cement, Sand, Iron Oxide, Wheat, Corn, Salt, Limestone, Castor Beans, Knots, Blocks, Paper, Wool, Cotton, Oats, Rags, Rubber, Vegetables, Coal (Powdered), Shavings, Cork, Sawdust . . . and any other materials that can be moved by air!

IMPORTANT NOTICE

For resisting abrasive action, Quickdraft units can be rubber lined. For withstanding corrosive gases, all Quickdraft units are available in standard acid resisting vitreous enamel, No. 316 Stainless Steel, rigid plastics (PVC), and with plastic and Fiberglas coatings.

Time and maintenance savings usually pay for Quickdraft high-pressure exhausters in 6 to 18 months on materials handling jobs. Because material does not pass through blower, maintenance is negligible. Downtime for cleaning and replacing fans, motors and

bearings is eliminated. Quickdraft units are also ideal for exhausting paint spray, abrasives, corrosive gases, noxious fumes and high temperatures. For Quickdraft engineering data on materials handling, industrial exhausting, heating plant venting, write today!



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Well known for power draft units
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Check 4490 opposite last page

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SERIES 1400
**LIQUID DEPTH
GAUGES**

**ACCURATE and
EASY TO INSTALL**

Available in 4 Models, Petrometer Series 1400 Tank Gauges operate on the sound principle of hydrostatic pressure. No moving parts, no expensive electrical or electronic equipment. Large vertical scale gives accurate, easy-to-see reading. And construction features make installation easy.

For complete
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CORPORATION

43-22 TENTH ST., LONG ISLAND CITY 1, N. Y.

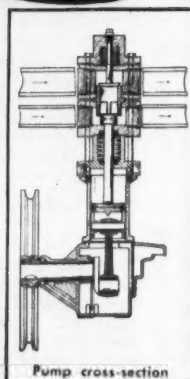
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New pipe line metering feed pump is the ideal answer to metering, feeding, injection and other processes requiring positive displacement pumping . . . at a low cost. It is well-suited to pumping slurries and viscous materials. Multiple inlet and discharge ports are particularly well-adapted to pumping from one circulating stream to another. The packing gland is on the low pressure side; high pressure packing is eliminated. It is well-suited to continuous processes requiring incremental slug feeding. It is available in capacities to 1 GPM and in a variety of construction materials. Write today for complete information.

SIGMAMOTOR Inc.

18 NORTH MAIN STREET MIDDLEPORT N. Y.



Check 4492 opposite last page

NEW LITERATURE

Centrifugal pumps for nuclear applications are discussed in four-page bulletin. "Nuclear Pumps" — Byron Jackson Pumps, Inc., Borg-Warner Corporation, P. O. Box 2017, Terminal Annex, Los Angeles 54, Calif.

Check 4493 opposite last page.

Safety clothing — Chemical resistance and safety factors of nine families of synthetic fabrics and films are detailed in six-page booklet. "Chemical Resistance Charts For Ply Garb Safety Clothing" — Milburn Company, 3246 East Woodridge, Detroit 7, Mich.

Check 4494 opposite last page.

Tube-expander drives, automatic, are explained in six-page, illustrated bulletin which contains easy reference chart designed to aid in selecting right model for right job. Bul 581 — Thomas C. Wilson, Inc., 21-11 44th Ave., Long Island City, N. Y.

Check 4495 opposite last page.

Forged steel globe valve features, construction, and specifications are detailed in Folder DH-213. Also available is wall chart that provides installation pointers, operating tips, and clues to longer valve life. "How to Protect Your Valves" — R-P & C Valve Div., American Chain and Cable Co., Reading, Pa.

Check 4496 opposite last page.

Two-position controllers for use in measurement and control of 6, 8, 12, 16, 20, or 24 thermocouple points are specified in two-page Data Sheet ND46-33(6) — Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.

Check 4497 opposite last page.

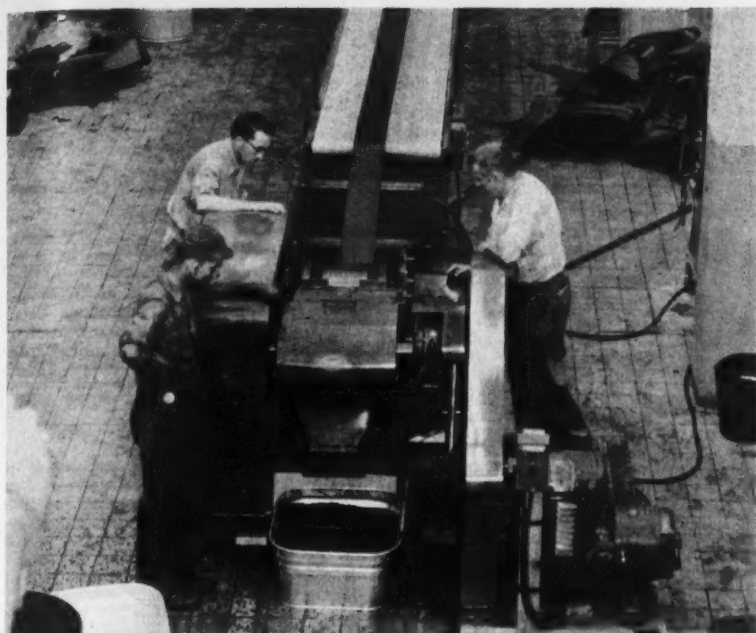
Infrared spectrophotometer for analysis of spectral region from 12.5 to 25 microns is detailed in a four-page brochure that covers operations, accessories, and specifications. "KBr Model 137 Infracord Spectrophotometer" — Perkin Elmer Corporation, Norwalk, Conn.

Check 4498 opposite last page.

Aluminum welding methods are detailed in 12-page folder. "Aluminum" — All-State Welding Alloys Co., Inc., White Plains, N. Y.

Check 4499 opposite last page.

Water Pollution Control — Progress made under Federal Water Pollution Control Act during 1957-58 is theme of 26-page booklet. Publication No. 631 may be obtained by submitting 25 cents direct to U. S. Dept. of Health, Education, and Welfare, Washington 25, D.C.



modernize your pelletizing of PLASTIC SHEETS & RODS

Use a Taylor-Stiles Pelletizer

Taylor-Stiles Pelletizers can lower your costs of producing accurately sized plastic pellets from continuous sheet or bar stock at production rates up to 10 tons an hour!

Pellets of uniform size, without fines or longs, make for better controlled compounding of extrusion mixes and batches.

Taylor-Stiles Pelletizers are available in several models, to fit your exact needs.

Their superiority is attested by the fact that America's most important producers of plastic stock in rolled and extruded form today use scores of Taylor-Stiles Pelletizers.

Why be handicapped in selling or using pellets with fines or longs that interfere with controlled compounding when you can get uniformly sized pellets by installing one of the several models of Taylor-Stiles Pelletizers?

To modernize your pelletizing operations and cut costs, write today for Bulletins 213 and 210, illustrating and describing Taylor-Stiles Plastic Pelletizers, the various knife arrangements available, principles of cutting, and other information.

TAYLOR, STILES & CO.

20 Bridge Street,

Riegelsville, New Jersey

Check 4500 opposite last page

NEW LITERATURE

Vinyl acetate monomer properties are discussed in detail in 20-page booklet. "Niacet Vinyl Acetate Monomer" — Union Carbide Chemicals Company Division, Union Carbide Corporation, 30 East 42nd Street, New York 17, New York.

Check 4501 opposite last page.

Retarding evaporation rate of an insecticide for white pine weevils by adding a chemical compound to extend its effective life, is described in series of notes by a Department of Agriculture entomologist. Aroclor 5460 — Organic Chemicals Div., Monsanto Chemical Company, St. Louis 24, Missouri.

Check 4502 opposite last page.

Waste treatment—Plastic packing material used in biological oxidation of liquid wastes is subject of 32-page bulletin. Properties and operational characteristics are included. "Dowpac—Applications in Waste Treatment"—Plastics Merchandising Dept., Dow Chemical Co., Midland, Michigan.

Check 4503 opposite last page.

Identification labels are depicted in 16-page catalog. Lists radioactivity-research, autoclave, addressograph, and microscope-slide labels. General Catalog — Professional Tape Co., Inc., 355 Burlington Avenue, Riverside, Ill.

Check 4504 opposite last page.

Pipe insulation is cataloged in nine-page brochure that includes application diagrams and suggested specifications. Pipe insulation brochure — Gustin-Bacon Manufacturing Company, 210 West 10th Street, Kansas City, Mo.

Check 4505 opposite last page.

Rotameter featuring Teflon tube adaptors designed for easy removal and interchange of different size metering tube, has design, capacity, and dimension details explained in four-page Spec Sheet SS-111-2 — Brooks Rotameter Co., Lansdale, Pa.

Check 4506 opposite last page.

Heated trough liner plates which quickly convert conventional feeders to in-transit feeding and drying units are specified in illustrated data sheet. Sheet PO 48533 — Syntrol Co., 110 Lexington Ave., Homer City, Pa.

Check 4507 opposite last page.

Stainless-steel valve line is outlined in Cat 59 SS — Jenkins Bros., Room 33, 100 Park Avenue, New York 17, N.Y.

Check 4508 opposite last page.

CORROSION- RESISTANT SEAMLESS WELDED and THREADED FITTINGS

*by Craftsmen
in Stainless Steel*

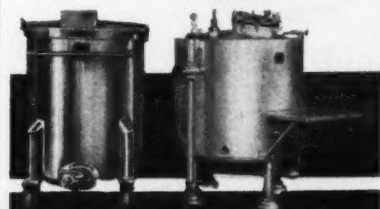


Whatever type of corrosion resistant fitting you need — welded, paper gasket, metal to metal or molded gasket UNIONS... A-P-C has it — in stainless steel. And A-P-C will make you special fittings to your specifications. A-P-C's motto is "one piece or a million."



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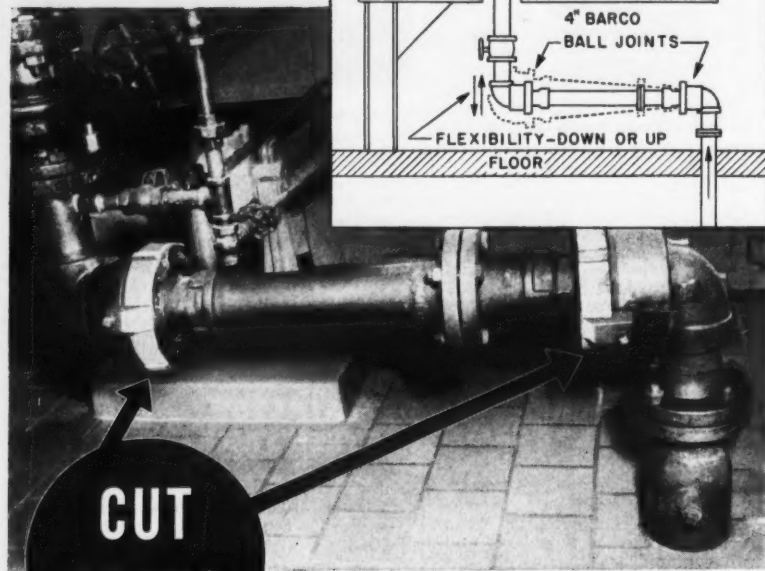
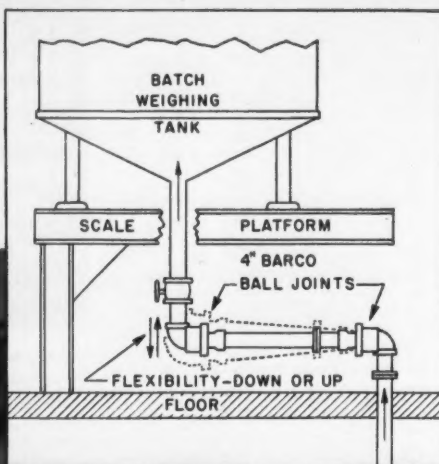
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Check 4509 opposite last page

Flexible Piping Connections

for BATCH WEIGHING TANKS



**CUT
COSTS**

with **BARCO** **BALL JOINTS**

FEATURES

COMPLETE LINE—Barco Ball Joints are available in seventeen sizes, 1/2" to 16". Straight and angle; screwed and flanged styles, or welding ends. Choice of corrosion resistant special alloys.

CHEMICALLY INERT GASKETS—Barco offers a choice of seven types of gaskets including No. 11-CT for corrosive service. No lubrication required.

MAXIMUM FLEXIBILITY—Up to 40° side flexibility with 360° rotating movement.

ENGINEERING RECOMMENDATION—Ask for a copy of new catalog 2158 and Bulletin 31 for thermal expansion applications.



BARCO MANUFACTURING CO.

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Barrington, Illinois

The Only Truly Complete Line of Flexible Ball, Swivel, Swing and Rotary Joints
In Canada: The Holden Co., Ltd., Montreal

THE above photograph and sketch show a typical chemical plant use for Barco Ball Joints in making flexible piping connections to chemical and processing tanks, vats, and vessels that move. In the case of weighing tanks, the movement usually is small but Barco Ball Joints (2, 3, or more) can be used to provide for virtually any movement desired.

Barco flexible connections offer a number of important advantages: (1) **PERMANENT.** Metal joints and pipe last a lifetime; easily withstand rough use; do not deteriorate. (2) **FIRE SAFE.** Important when handling hydrocarbons, oils, chemicals. Will not blow out. (3) **ELIMINATE MAINTENANCE.** Do not have to be replaced periodically.

For recommendations on how to use Barco Flexible Ball Joints, ask for a Barco engineering field representative—located in principal cities.

Check 4510 opposite last page

NEW LITERATURE

Chrome complex—capable of imparting water repellancy and boosting chemical resistance of paper, textiles, leather, and similar products is discussed in revised 10-page booklet. "Quilon Chrome Complex" — Grasselli Chemicals Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. Check 4511 opposite last page.

Pressure exchange pumps, stainless steel, reciprocating rotary type, are subject of company bulletin that provides experienced advice and factual data on best method to move or blend your product. Bul P-55—Manton Gaulin Mfg. Co., Inc., 55 Garden St., Everett 49, Mass.

Check 4512 opposite last page.

Radioactive materials handling is described in revised 429-page book containing 351 illustrations which gives detailed descriptions and design data for hot lab facilities, equipment and accessories. "Hot Laboratory Equipment" — remit \$2.50 to Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Grout cement which is acid-proof is described in four-page bulletin. Bul 108-A — Nukem Products Corporation, Buffalo 20, N. Y. Check 4513 opposite last page.

Salt cake handling and its problems are discussed in eight-page bulletin. Tables, and schematic and dimensional drawings detail characteristics and capabilities of various systems. Fact File ER-26-1—Fuller Co., Catasauqua, Pa.

Check 4514 opposite last page.

Electromechanical car shaker is described and illustrated on data sheet giving construction, application, operation, dimensional layout. Sheet PO 47804-A—Syntron Co., 110 Lexington Ave., Homer City, Pa.

Check 4515 opposite last page.

Pressurized screens for use in paper mills are described and diagramed in 12-page bulletin. Bul 24-SB — Shartle Division, The Black-Clawson Company, Middletown, Ohio.

Check 4516 opposite last page.

GRIND BETTER BY

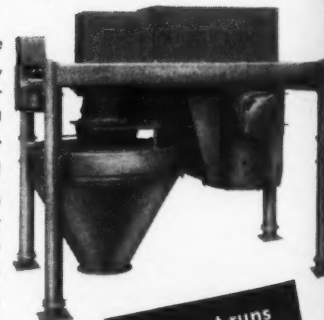
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For closely controlled particle size reduction, minimum temperature rise, high abrasion resistance and low horsepower requirements with no grinding tolerances to maintain.

RECENT APPLICATION

Grinding raw glass scrap to 95% minus 16 mesh. Entoleter® Impact Mill with wear resistant impactors for economical tonnage processing of this extremely abrasive material.

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Free test runs
on your material.



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P. O. Box 904, New Haven, Conn.

Check 4517 opposite last page

CHEMICAL PROCESSING

NEW LITERATURE

Ovens with temperatures to 1000°F; heated-humidified-refrigerated bacteriological incubators; forced-draft mechanically connected ovens are detailed in Bul 958-10—Electric Hotpack Co., 5033 Cottman Ave., Philadelphia 35, Pennsylvania.

Check 4518 opposite last page.

Phosphoric acid properties and safe handling have been compiled in 13-page safety reference booklet. Control of hazards, handling and storage, aspects of employee safety, and other factors in using material are described. Remit 30c for "SD-70, Phosphoric Acid" to Manufacturing Chemists' Association, Inc., 1625 Eye Street N. W., Washington 6, D. C.

Continuous stream analyzers for industrial application are described in eight-page bulletin. Supplies specifications and typical applications of pH, chromatographic, IR, colorimetric, and oxygen-analyzing equipment. Bul CL-4000—Beckman/Scientific & Process Instruments Div., 2500 Fullerton Rd., Fullerton, Calif.

Check 4519 opposite last page.

Wire cloth-filter cloth, in rolls or cut pieces or in fabricated components, are covered in manufacturer's catalog. Multi-Metal Wire Cloth Co., Inc., 1356 Garrison Ave., New York 59, N.Y.

Check 4520 opposite last page.

Connectors for flexible metal hose are illustrated, described, and priced in 16-page catalog. Included is recently introduced line of wet heat connectors. Cat 658 — Cobra Metal Hose Company, 5059 S. Kedzie Ave., Chicago 32, Ill.

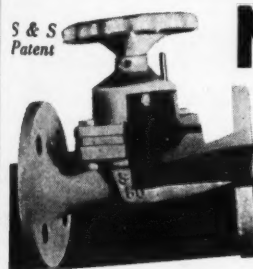
Check 4521 opposite last page.

Specific-gravity tester of in-line hydrometer type is described in four-page Spec Bul 14E1735—Fischer & Porter Co., 831 Jacksonville Rd., Hatboro, Pa.

Check 4522 opposite last page.

Fluid power equipment of various types is discussed in 12-page bulletin which includes specifications and illustrations. Bul 10051-G — The Oilgear Company, 1570C West Pierce St., Milwaukee 4, Wisconsin.

Check 4523 opposite last page.



NOW

- new safety
- longer life
- greater economy

with the New Packless, Corrosion Resistant

DIA-PLUG VALVES

for liquids and gases, acids, alkalis, slurries, etc.

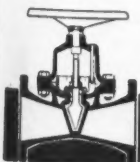
DIA-PLUG VALVES WILL

- INSURE PERFECT CLOSURE ALWAYS
- CUT MAINTENANCE TO A MINIMUM—Dia-Plug can be changed on the line
- WORK WITH ALMOST ANY AIR OPERATOR
- OFFER EXCELLENT THROTTLING CHARACTERISTICS
- SELF DRAINING ON HORIZONTAL LINE
- TRAVEL INDICATOR FOR HAND VALVES AT NO EXTRA COST

Heart of this new valve is a combination of rugged diaphragm and metal plug which insures dead tight closure even if the diaphragm is damaged. An important safety plus that may save a life, or many dollars in process.

The Dia-Plug requires less force to close—allowing for use of smaller, more economical air operators or minimum manual effort. Dia-Plug valves can withstand temperatures to 400° F. and pressures to 300 psi. Standard sizes 3/8" to 8" in cast iron or steel, stainless, bronze, aluminum, etc.

Write for complete details and catalog



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Check 4524 opposite last page

For SPEED, SIZE, SAVINGS and SAFETY

FLETCHER SUPER CENTRIFUGALS

SOLVE YOUR PROBLEMS

Call on Fletcher to solve your toughest problems in centrifugal engineering.

For example, this super-suspended centrifugal—the Fletcher Super-S-Omatic broke through the speed barrier. Until it was developed, no centrifugal of this size existed that achieved 1600 RPM = 1750 G's.

This Fletcher centrifugal, with a gravity of 1750 G's, is coupled with a production rate of 16 cubic feet per batch. This unit is capable of 6 production cycles per hour.

The Fletcher Super-S-Omatic features infinite variable speed by fluid mechanical drive. It's completely automatic—at the touch of a button it automatically starts, feeds, skims, brakes, unloads and then recycles.



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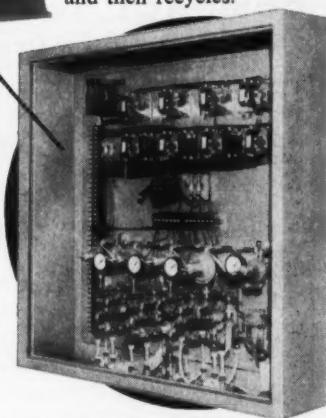
Eliminates all possibility of human error. Assures perfect performance. Completely safety interlocked. Cuts labor costs 100%.

Regardless of how intricate the schedule of centrifugation, the Fletcher Electro-Numatic Brain thinks it through all the way.

FLETCHER PILOT PLANT CENTRIFUGAL



Rugged, compact machine combines functions of extractor, separator and clarifier. Results from this test unit can be accurately scaled up to production unit.



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CENTRIFUGAL
DIVISION

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JOHNSON
Direct Operated
**SOLENOID
VALVES**

**Stainless steel
valve and seat.**
Sizes: 1/2" to 3".
Write for facts.

Job after job, these Johnson Direct Acting Solenoid Valves are proving an ideal answer for service on steam lines. Their design removes the solenoid proper from the heat of the line, permits a leverage system with ample power to open against differential pressures up to 150 lbs. There are no pilot valves or auxiliary pistons, and construction is really heavy duty throughout. You will find their inherent simplicity and instant response will solve a lot of operating problems like no other valve can.



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Check 4526 opposite last page

COMPACT and PORTABLE! 500 DeLuxe Drum Rotator

by
MORSE
*Faster, Lower Cost
More Thorough*

- MIXING
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Handles 30 and 55 gal. drums; and with special attachments, 1 and 5 gal. containers; weight capacities up to 500 lbs. Powerful, smooth, motorized unit. Available with 10, 20 or 40 rpm. Weighs only 137 lbs. Neoprene drive wheels are oil and chemical resistant. Also available with explosion-proof motor. Patented features and design make this the finest portable rotator available.



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757 West Manlius Street, East Syracuse, N. Y.

Check 4527 opposite last page

NEW LITERATURE

Controlled-volume pump designed to provide accurate metering of chemicals against pressures to 1900 psi in adverse atmospheres is specified in Bul 258—Milton Roy Co., 1300 E. Mermaid Lane, Philadelphia 18, Pa.

Check 4528 opposite last page.

Dust collectors with efficiency of 99.9%, even with sub-micron particles, are described in bulletin. The cabinet-type, cloth-bag units can handle up to 500 cfm. Dust collector data sheet—Dept. KP, Torit Manufacturing Co., Walnut and Exchange St., St. Paul, Minn.

Check 4529 opposite last page.

Tricresyl phosphate — Flame-retarding plasticizer's applications and properties are detailed in 12-page Tech Bul PL-305 — Organic Chemicals Division, Monsanto Chemical Company, PO Box 478, St. Louis 3, Mo.

Check 4530 opposite last page.

Crane controllers for light industrial AC cab or floor-operated models are outlined in four-page bulletin. Components, enclosures available, and applications are detailed. Bul 6431—The Electric Controller & Mfg. Co., Div. of Square D Co., 4500 Lee Rd., Cleveland 28, Ohio.

Check 4531 opposite last page.

Preamplifier is depicted in six-page bulletin which includes physical and electrical characteristic curves. Bul P-15 — Control, Division of Magnetics, Inc., Box 391, Butler, Pennsylvania.

Check 4532 opposite last page.

Starters — Design and construction features of automatic reduced-voltage starters are contained in 12-page bulletin. Theory and operation of low-voltage units are described. Bul 14B8192 — Allis-Chalmers Manufacturing Company, Milwaukee 1, Wis.

Check 4533 opposite last page.

Molecular models — Two-page folder illustrates kit of 100 plastic atom models which are both compressible and flexible, as are the atoms they represent. Molecular Model Kit Folder — Will Corp., Box 1050, Rochester 3, N. Y.

Check 4534 opposite last page.

Shippingport nuclear reactor—Bibliography of 44 pages listing references covering design, development, and construction has been compiled by AEC. Publication TID-3068 may be ordered for \$1.25 from Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D. C.

UNIQUE AIR CYLINDER



CUTS COSTS
NO EXTRA VALVES TO BUY

4-way directional valve, and two-way speed control valves are built-in features of this different air cylinder. No extra valves to buy. It's a complete packaged air-power unit. You can have your choice of six built-in valve arrangements. Five bore sizes. Any stroke length.

FREE 4-Color Bulletin gives details

Write Dept. CP-359, The Bellows Co., Akron 9, Ohio. In Canada: Bellows Pneumatic Devices of Canada, Ltd., Toronto 18. Ask for Bulletin BM-25.

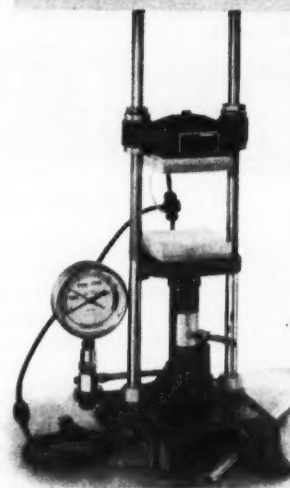
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The Bellows Co.
DIVISION INTERNATIONAL PNEUMATIC EQUIPMENT
AKRON 9, OHIO

Check 4535 opposite last page

The CARVER LABORATORY PRESS



*...Solutions
for
Pressing
Problems*



Accurately controlled pressures to 20,000 lbs.; 6-inch gauge mounted on base. Carver Standard Accessories include Electric or Steam Hot Plates, Carver Test Cylinders, Swivel Bearing Plates, Cage Equipment. Available from stock. Write for catalog.

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HYDRAULIC EQUIPMENT
11 CHATHAM ROAD, SUMMIT, N. J.

Check 4536 opposite last page

CHEMICAL PROCESSING

NEW LITERATURE

Ion exchange — its principles, applications, test procedures, and laboratory techniques are discussed in bound 75-page book. Ion exclusion and ion retardation are also presented. Copies of "Dowex: Ion Exchange" are available to company departmental libraries by writing direct to Engineering Chemicals Sales, The Dow Chemical Company, Midland, Michigan.

Thermistor-based temperature measurement and control instruments for extended ranges are covered in four-page brochure. Short Form Catalog — Yellow Springs Instrument Co., Yellow Springs, Ohio.

Check 4537 opposite last page.

Plastic pelletizers are illustrated and described in company bulletins that cover various knife arrangements available, principles of cutting, and other pertinent information. Buls 210, 213—Taylor, Stiles & Co., 20 Bridge St., Riegelsville, N.J.

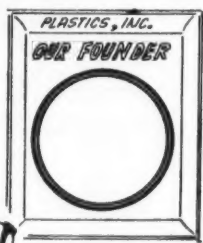
Check 4538 opposite last page.

Conveyor pulley which is strong, lightweight, inert, non-toxic, tasteless, odorless, non-sparking, and weather resistant is specified in four-page bulletin and technical data sheet. Bul 120 with Tech Data Sheet—Mercury Industries, Inc., 365 Broadway, Hillsdale, New Jersey.

Check 4539 opposite last page.

Engineering, fabrication, and erection services offered by engineering firm are described in four-page booklet. "Creative Craftsmanship in Steel" — Chicago Bridge & Iron Company, 2421 McCormick Building, Michigan Avenue, Chicago 4, Illinois.

Check 4540 opposite last page.



Permanent magnetic circuits are discussed with accompanying sketches in **Applied Magnetism** for July-September, 1958 — Indiana Steel Products Company, Valparaiso, Ind.

Check 4541 opposite last page.

Air compressor of rotary, mobile type is described in four-page bulletin which makes liberal use of photographs to illustrate features of unit. Bul 121B — Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wis.

Check 4542 opposite last page.

Pneumatic conveyors to reduce operating costs and improve plant efficiency are specified in 16-page bulletin. Actual installations, basic equipment, and accessories are illustrated. Bul M-588—Day Sales Co., 810 Third Ave., N.E., Minneapolis 13, Minn.

Check 4543 opposite last page.

Stacking and loading of corrugated boxes is dealt with in 16-page booklet giving detailed illustrations. "How to Stack and Load Corrugated Shipping Boxes" —Hinde & Dauch, subs. of West Virginia Pulp and Paper Co., Sandusky, Ohio.

Check 4544 opposite last page.

Palletized handling of kegs and multi-sized cartons to increase warehouse space and decrease working force is itemized in step-by-step six-page bulletin. Pallet sizes, stacking heights, and necessary equipment are specified. Bul 509-2—Dept. R-28, Lewis-Shepard Products, Inc., 125 Walnut St., Watertown 72, Mass.

Check 4545 opposite last page.

Aromatic chemicals, essential oils, and certified colors are described in 36-page booklet. Market information is also included. "Price Catalog October 1958" — Dodge & Olcott, Inc., 180 Varick St., New York 14, N. Y.

Check 4546 opposite last page.

Endpoint detector and volumetric syringe are depicted in 12-page bulletin which includes diagrams and filter table. Bul 285 — Central Scientific Company, 1700 Irving Park Road, Chicago 13, Ill.

Check 4547 opposite last page.

Line of laminated plastics are described in revised 12-page catalog. Industrial applications and tables of properties are found in Cat 20.000.13—The Richardson Company, 2731 Lake St., Melrose Park, Ill.

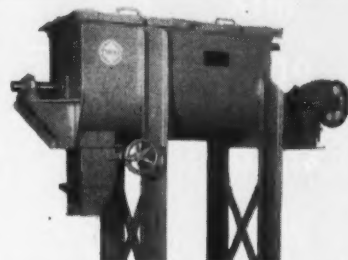
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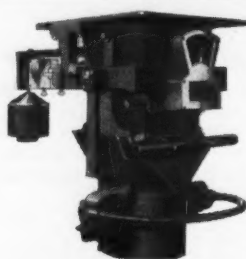
The Right Place to Look FOR A BETTER BUY



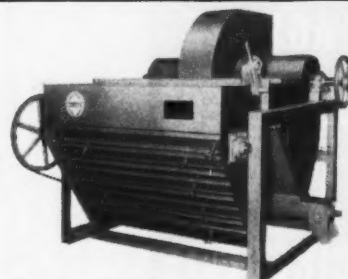
SIZING—New clean cut sizing at high speed without heat. Trial runs arranged in our plant.



MIXING—30 mixers, horizontal and vertical. Mixall and Sanimix in Stainless, and Standard.



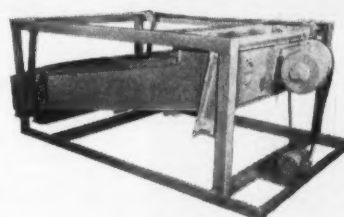
WEIGHING—Portable bagging scales and accessories. 2 models—weigh 25 to 200 lbs. Also packers.



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Each unit expertly designed, precisely built to deliver efficient, durable service... alone or in combination with other EUREKA units. Wide selection of standard models in a variety of sizes and capacities or custom built to exact specifications. Your request for information or quotations will receive prompt, personal attention.

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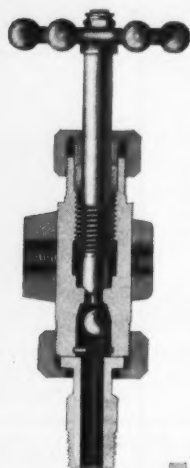
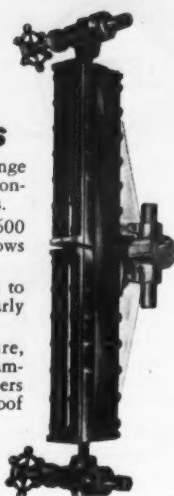
Check 4549 opposite last page

MEASURE
MIX
PUMP
EXHAUST
WASH
AERATE
AGITATE
COMPRESS
ATOMIZE
CIRCULATE
INJECT
EXTRACT

PENBERTHY Direct Reading LIQUID LEVEL GAGES

Designed with exclusive features for range of pressures, temperatures, corrosive conditions or other specific requirements.

- **REFLEX** — 3 pressure groups to 3600 psig. Lengths to 12 ft. Liquid shows black for positive accuracy.
- **TRANSPARENT** — 4 pressure groups to 10,000 psig. Lengths to 12 ft. Clearly shows color, density on media.
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Exclusive "floating shank" saves on installation, eliminates strains common to forced installations.

- Threaded Valves for service to 6000 PSI
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Hydraulic, air and steam operated Penberthy ejectors (jet pumps, eductors, exhausters and syphons) simplify handling of fluids, vapors, gases and "hot" materials. In a variety of standard and special designs and materials.

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Automatic, electric, explosion-proof, submersible and standard types in 8 models, 20 sizes.



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- EJECTORS
- INJECTORS
- CYCLING JET PUMPS
- LIQUID LEVEL GAGES
- GAGE VALVES
- SUMP PUMPS

Check 4550 opposite last page

NEW LITERATURE

pH meter and electrodes are cataloged in 4- and 8-page bulletins, respectively. Bul 911 and 912 — Cambridge Instrument Co., Inc., 3732 Central Terminal, New York, New York.

Check 4551 opposite last page.

Sifters are described in leaflet that gives technical data and engineering drawings along with design, construction, and operation information. Bul 138-B — Sprout, Waldron & Co., Inc., 130 Logan Street, Muncy, Pa.

Check 4552 opposite last page.

Chlorinated-rubber resins and plasticizers are described in detail in 13-page Tech Bul PL-311 — Organic Chemicals Division, Monsanto Chemical Company, PO Box 478, St. Louis, Mo.

Check 4553 opposite last page.

Nitrogen generators operating on fully automatic, dry process are featured in 4-page bulletin. Bul 197 — Gas Processing Div., Lindberg Engineering Co., 2443 W. Hubbard Street, Chicago 12, Ill.

Check 4554 opposite last page.

Storage racks of simple construction are shown in four-page folder. Racks are easy to erect or dismantle by hand, and store almost any kind of material. "Series 58 Storage Racks" — Palmer-Shile Co., 16000 Fullerton Ave., Detroit 27, Mich.

Check 4555 opposite last page.

Nuclear fuels relation to reactor performance is described in 24-page booklet. Illustrations and detailed line sketches are included in "Nuclear Fuels: Key to Reactor Performance" — Sylvania-Corning Nuclear Corp., Bayside, N. Y.

Check 4556 opposite last page.

Heat exchangers and storage water heaters are subject of 8-page bulletin. Product information and selection data are included. Bul 123-6 — Patterson-Kelley Co., Inc., East Stroudsburg, Pennsylvania.

Check 4557 opposite last page.

Proportioning system application in rubber company is depicted in six-page Bul 715 — Richardson Scale Co., Clifton, N.J.

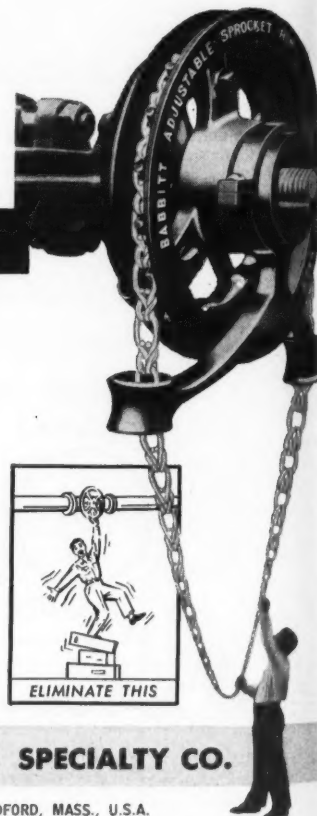
Check 4558 opposite last page.

Safe Operation of Overhead Valves with a

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Adjustable
SPROCKET RIM
with Chain Guide

- Simplifies pipe layout
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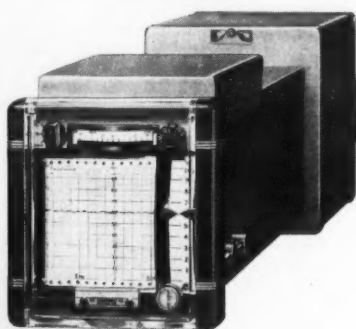
14 BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

Check 4559 opposite last page

CHEMICAL PROCESSING

AC — dc

this year
more than
ever
in process
control



The past year has been revolutionary. Electronic process control has won universal acclaim on every consideration: simplified installation . . . reduced maintenance . . . and, most important, better control performance. The evidence was so conclusive that other systems were totally ruled out on many new installations.

Swartwout pioneered electronic process control so Swartwout had a definite advantage: it was free to select the ideal circuit. AC in the measuring circuit has given unmatched simplicity and reliability extending the lengths and heights of the processing plant. DC is rightly used for the actuator. Experience has borne out the wisdom of this selection.

Moreover, Swartwout has shown that this vastly better control can be furnished without increased cost over pneumatic systems.

Send for Bulletin Series A-801. The Swartwout Co., 18511 Euclid Avenue, Cleveland 12, Ohio.



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process instrumentation

S.A. 1940

Check 4560 opposite last page

NEW LITERATURE

Industrial chemicals—revised 64-page catalog lists complete line of products including surface active agents, intermediates and specialties. Annotated table of contents has been provided. Antara Chemicals Div., General Aniline & Film Corp., 435 Hudson St., New York
Check 4561 opposite last page.

Compression packings, rod and sheet types, have applications shown on handy chart suitable for hanging on wall or storage bin in maintenance shop. Val-Pac Recommendation Chart — E. F. Houghton & Co., 303 West Leigh Ave., Philadelphia 33, Pa.
Check 4562 opposite last page.

Magnetic-flow meter applications are outlined for water distribution (Application Data Sheet 831-39), raw sewage at pumping station (Sheet 832-5), and sewage-sludge measurement (Sheet 832-6) — The Foxboro Company, Foxboro, Mass.
Check 4563 opposite last page.

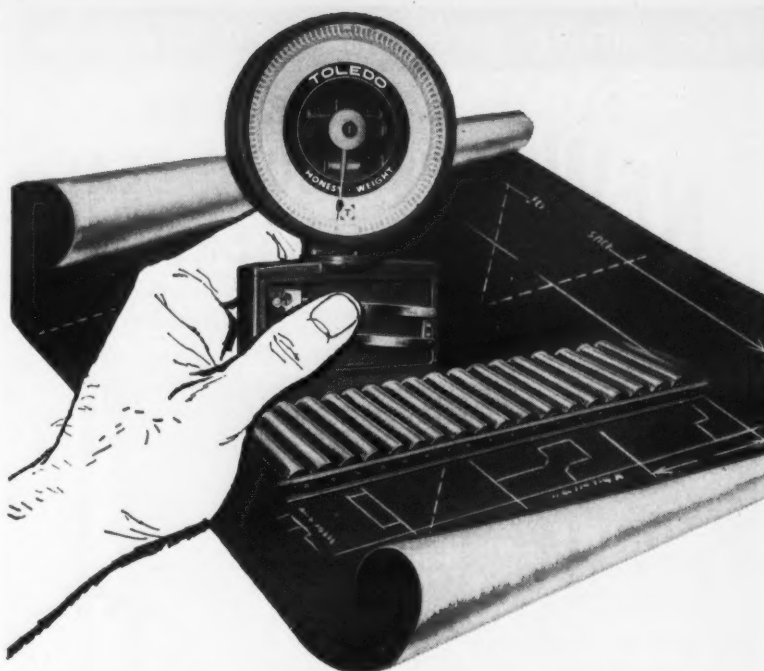
Cranes, carriers, tractors, etc., and wide variety of overhead materials handling installations are reviewed in 12-page booklet 2008-N — Cleveland Tramrail Div., Cleveland Crane & Engineering Co., 1036 E. 289th St., Wickliffe, Ohio.
Check 4564 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

Vibrating conveyors to handle materials up to 1800°F are described in four-page catalog. Designs and dimensions are included. Data Sheet 700-HT-9—Carrier Conveyor Corp., 211 N. Jackson St., Louisville, Ky.
Check 4565 opposite last page.

Fabrication of Hastelloy alloys is subject of 36-page booklet. Information on lining of vessels is also included. Booklet F-30,126 — Haynes Stellite Co., Div. of Union Carbide Corp., Kokomo, Indiana.
Check 4566 opposite last page.

Air Force research on feasibility of a missile propelled by energy from oxygen taken from atmosphere is subject of 63-page report. To obtain report PB-131580 remit \$1.75 direct to Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D. C.



the cost-saving trend today
puts **BETTER CONTROL**
where it counts most!

On industry's scales, materials become money. Weight records directly affect costs, quality, inventories and customer billing. That's why it is so vitally important to put *Toledos* at all weighing points . . . where control counts most!

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... complete printed weight records at your fingertips!

- Prints where you wish on full 8½" x 11" forms, or on tickets; also on strips.
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- Date and time may be printed automatically.
- Transmits weight data for recording by remotely located office machines, if desired.

Ask for Bulletin 2017



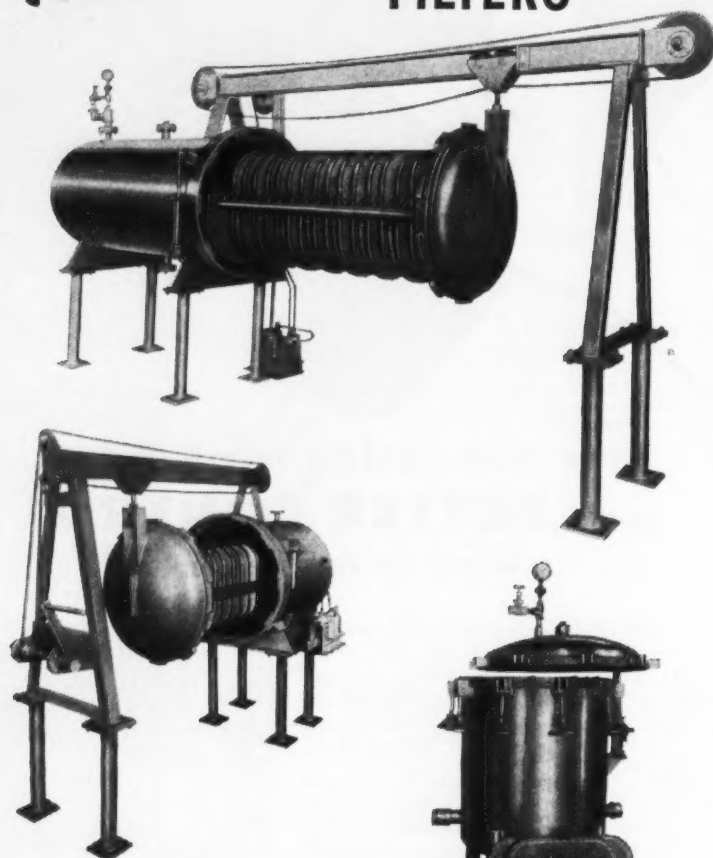
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● For perfect filtrate clarity, high flow rate, effective washing, quick discharge of cake, and easy cleaning . . . Shriver horizontal tank, vertical leaf filters—tank diameters 36" to 72"; number of leaves—12 to 60; cake capacity—6 to 200 cu. ft.

● For high rate clarification of large quantities of liquid containing low percentage of compressible solids, for sluicing and reslurrying of cake . . . Shriver vertical tank, vertical leaf filters: tank diameters—18" to 48"; number of leaves—5 to 21; cake capacity—1.5 to 31 cu. ft.

Write for Bulletin No. 146.

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846 HAMILTON STREET • HARRISON, N. J.

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SLAB FORMERS • DIAPHRAGM PUMPS • ELECTROLYTIC CELLS

Check 4568 opposite last page

NEW LITERATURE

Hydraulic-panel fabrication technique is analyzed in eight-page brochure that outlines use of standardized components. Bul H-58 — Petch Manufacturing Company, 463 York, Detroit, Mich.

Check 4569 opposite last page.

Hydraulic weighing system applications are detailed in 16-page catalog. Brochure is sectionalized for ready access to engineering and application data. Questionnaire and sketch sheet provide check against accuracy of selection and pricing. Bul 582 — The A. H. Emery Company, New Canaan, Connecticut.

Check 4570 opposite last page.

Plating chemicals and anode line are described in 8-page bulletin. Criteria for anodes are discussed. Over a dozen salts used in electroplating are listed. Bul AC-111 — Hanson - Van Winkle - Munning Co., Matawan, New Jersey.

Check 4571 opposite last page.

Laboratory balances, balance weights, and accessories are listed in 32-page "Harshaw Scientific Balance Bulletin" — Harshaw Scientific, Division of The Harshaw Chemical Co., 1945 East 97th Street, Cleveland 6, Ohio.

Check 4572 opposite last page.

Explosion-proof equipment in the electrical field is discussed in six-page Bul 2710 — Crouse-Hinds Company, Syracuse 1, N. Y.

Check 4573 opposite last page.

Maleic anhydride's uses and characteristics are detailed in 18-page Tech Bul RE-5 — Organic Chemicals Division, Monsanto Chemical Company, Lindbergh & Olive Street Road, St. Louis, Mo.

Check 4574 opposite last page.

Remotely controlled devices for handling radioactive or toxic materials are discussed in 20-page booklet. Cross-sectional views and specifications are provided. Brochure on handling devices may be obtained from Nuclear Equipment Department, Mechanical Div. of General Mills, Inc., 1620 Central Ave., Minneapolis 13, Minn.

Check 4575 opposite last page.

Box stitching method is discussed in question and answer technique in 10-page booklet. Included is description of method, its advantages, and how existing equipment can be converted to Arcuate stitching. Bul AD-122 — Acme Steel Company, 135th St. and Perry Ave., Chicago 27, Ill.

Check 4576 opposite last page.



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A broken centrifuge at Marriner Combing Company stopped production on an important order. PLASTIC STEEL was used for on-the-spot repairs and the machine was back in operation within an hour at a cost of less than \$5.00. Using conventional repair methods would involve several days and cost over \$1000.

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Check 4577 opposite last page

CHEMICAL PROCESSING

AIRETROL



automatic tube expansion control

rolls $\frac{1}{4}$ "- $1\frac{1}{2}$ " O.D. tubes pneumatically faster than you ever thought possible. Average worker easily rolls up to 12 tubes per minute.

Here's why . . .



Operator dials desired torque in ft.-lbs. on micrometer head. Precision torque-sensing mechanism automatically stops expansion at this setting . . . maintains .001" accuracy consistently. Result? More work per man-hour, operator error eliminated. Write for Bulletin No. 64 or plant demonstration.



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REPRESENTATIVES: in principal cities of U.S.A., Canada, Mexico, South America, England, Europe, Puerto Rico, Italy, Japan, Hawaii.
EUROPEAN PLANT: Vlaardingen, The Netherlands.
CANADIAN PLANT: Brantford, Ontario

Check 4578 opposite last page

NEW LITERATURE

Drum covers to prevent dusting and contamination during automatic weighing of materials are specified in two-page Product Data Sheet 5804 — Richardson Scale Co., Van Houten Ave., Clifton, New Jersey.

Check 4579 opposite last page.

Control systems have design approach, materials, construction, and modern facilities used in their manufacture described in 16-page Bul 106 — Panellit Div., Panellit, Inc., 7401 N. Hamlin Ave., Skokie, Illinois.

Check 4580 opposite last page.

Chromatographic column performance is discussed in 18-page data sheet which includes characteristics of 22 columns and performance of 28 columns. Data Sheet GC-90-MI — Beckman/Scientific and Process Instruments Division, 2500 Fullerton Road, Fullerton, California.

Check 4581 opposite last page.

Pressure-vessel design is outlined in handbook which eliminates need for lengthy computations. "Pressure Vessel Design Handbook" — American Car and Foundry Division, ACF Industries, Incorporated, 750 Third Avenue, New York 17, N.Y.

Check 4582 opposite last page.

Cryogenic pumps of two-turbine and immersed-reciprocating types are described in four-page Folder F-1251 — Linde Company Division, Union Carbide Corporation, 30 East 42nd Street, New York 17, N.Y.

Check 4583 opposite last page.

Package steam generators and hot-water generators are shown in four-page folder giving specifications for all models in each line. Form 35 — Cyclotherm Division, National-U.S. Radiator Corporation, Oswego, N. Y.

Check 4584 opposite last page.

Catalysts, including stock and experimental types, are described in revised 37-page catalog. Fields of application and customer services are also covered. GC 2000 — Girdler Catalysts, Box 337, Louisville 1, Ky.

Check 4585 opposite last page.

Tube fitting line is shown in 28-page catalog which includes specifications of high-pressure steel pipe fittings commonly used in hydraulic systems. Cat 556 — Flodur Corporation, 16911 St. Clair Avenue, Cleveland 10, Ohio.

Check 4586 opposite last page.

MINIMITE

Portable

Pyrometer

Indicator

is

Accurate,

Versatile

NULL BALANCE,
POTENTIOMETER
TYPE

The "MiniMite" Portable Pyrometer Indicator gives you laboratory accuracy—in a rugged, versatile instrument. You can use it dependably for a wide range of temperature measurement, calibration and test purposes. Carry it around and set it up wherever you need it. Heavy use won't impair its performance or accuracy.

Temperature Measurement

When connected to a thermocouple the "MiniMite" will measure temperature directly. Use it for laboratory work, emergency operation, or as a substitute for instruments under repair. It's also ideal for a wide variety of research and test work. Automatic cold-junction compensation is built-in.

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You can use the "MiniMite" to check the calibration of thermocouples and potentiometer-type instruments. When connected to a variable voltage supply, the "MiniMite" can check millivoltmeter-type instruments.

Scale Range

Despite the "MiniMite's" small size, individual ranges on its double-range scale are almost 24" long. A choice of 53 different range combinations covers

temperatures from -300°F. to $+3200^{\circ}\text{F.}$ for Copper-Constantan, Iron-Constantan, Chromel-Alumel and Platinum-Rhodium-Platinum—and millivolts from -6.2 to $+62$. Accuracy is $\frac{1}{4}$ of 1% of scale range.

Convenience

The "MiniMite" measures only 4" x 5" x 6" and weighs under 4 lbs. It will function in either horizontal or vertical position. Widely spaced graduations permit easy, accurate readings. Cold-junction compensation can be cut in or out by a single switch.

Immediate Delivery

"MiniMites" with the 13 most popular double-range scales are available for immediate delivery. For other ranges—3-4 weeks' delivery.

Write for Bulletin 64-R



In Canada: THERMO ELECTRIC (Canada) LTD., Brampton, Ont.

Check 4587 opposite last page



LAST LONGER IN CORROSIVE CHEMICALS

Garlock Chemiseal® Mechanical Seals possess greater immunity to corrosion and are more economical than any other design offered. This reputation is based on fact—customers report unsurpassed performance on applications like these:

- **Pumping HYDROXYACETIC AND SULFURIC ACID**
1750 rpm, 1½" shaft, 10 lbs. suction, 60 lbs. discharge. Temperature of medium 30° C. RESULT: Chemiseal greatly extended service life.
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3600 rpm, 625 lbs. discharge, 30 lbs. suction. Stuffing box pressures 15 lbs. to 65 lbs. Temperature of medium 70° C. RESULT: Chemiseal gave longer, leak-proof operation.
- **Pumping CONCENTRATED SULFURIC ACID**
1750 rpm, 1½" shaft, 2 lbs. suction, 45 lbs. discharge. Temperature of medium 65° C. RESULT: Chemiseal gave longer life.
- **Pumping ADIPIC ACID AND HYDROCARBON SLURRY**
1750 rpm, 1½" shaft, 35 lbs. suction, 75 lbs. discharge. Temperature of medium 70° C. RESULT: Chemiseal lasted longer, cut downtime.

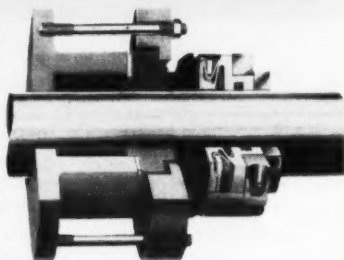
Join the list of satisfied users. You can apply standard Garlock Chemiseal Mechanical Seals to all pump shafts from ½" to 2½". Special sizes also available. They seal against all mediums—including solids in suspension—in pressures to 100 psi at 75° C, or 75 psi at 100° C. Chemiseal Mechanical Seals are another of the Garlock 2,000 . . . two thousand different types of gaskets, packings, and seals for every need. Find out complete details by contacting your local Garlock representative, or write for Catalog AD-164.

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Molded and Extruded Rubber, Plastic Products

Canadian Div.—The Garlock Packing Co. of Canada Ltd. • Plastics Div.—United States Gasket Co.



Check 4588 opposite last page

NEW LITERATURE

Digital-demand recorder is covered in 16-page catalog. "The Punched Tape Digital Demand Recorder" — Fischer & Porter Company, 828 Jacksonville Road, Hatboro, Pennsylvania.

Check 4589 opposite last page.

Plastic films and foam sheetings made by exclusive process are detailed in technical data kit. Samples are included. "Protection for Your Product" — Plastics Division, Ludlow Papers, Inc., Needham Heights 94, Mass.

Check 4590 opposite last page.

Humidity and temperature recorders are delineated in application data sheets which include photos, specifications, and schematic layouts. Application Data Sheets 220-46 and 220-63 — The Foxboro Company, Foxboro, Mass.

Check 4591 opposite last page.

Industrial drain construction products are listed in 12-page Cat Gen-10658 — Armco Drainage & Metal Products, Inc., Middletown, Ohio.

Check 4592 opposite last page.

Pipe fittings — Updated technical data, for allowable S-values and working pressures of fittings, pressure-temperature rating of flanges, and corrosion resistance of stainless-steel welding fittings and flanges, are included in 52-page Bul TT600 — Tube Turns Division, Chemetron Corporation, 222 East Broadway, Louisville 1, Ky.

Check 4593 opposite last page.

Propionaldehyde applications are discussed in revised 12-page data sheet. Typical reactions and uses in resin, pharmaceutical, and rubber chemical industries are among those included. Propionaldehyde Data Sheet — Union Carbide Chemicals Co., Union Carbide Corp., 30 East 42nd St., New York 17, N.Y.

Check 4594 opposite last page.

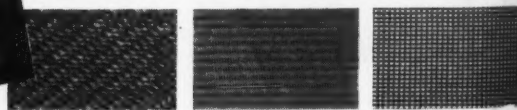
Self-contained annunciators having no moving parts to be affected by climatic conditions are detailed in four-page brochure. Units do not use relays or solenoids. Bul 1058 — Scam Instrument Corp., 1811 W. Irving Park Rd., Chicago 13, Illinois.

Check 4595 opposite last page.

Wire Cloth-Filter Cloth

TO YOUR EXACT REQUIREMENTS

in Rolls or
Cut Pieces



WIRE CLOTH all standard grades, for Industrial and Paper Mill use, all weaves, widths to 244", corrosion-resistant alloys.

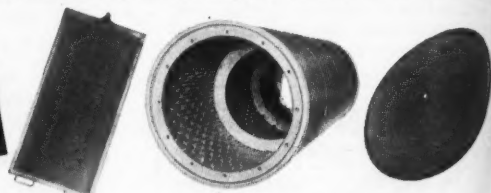
FILTER CLOTH all standard weaves and densities, woven in corrosion resistant alloys, extra wide.

NEVA-CLOG perforated metal sheet filter medium—strong, rigid, smooth, non-clogging.

MYKRO-PORE electrodeposited metallic filtering or straining medium with retention to 20 microns.

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in Fabricated
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"RIM-LOK" leaves for stationary leaf batch pressure filters, vertical or horizontal shell. Filter leaves (bare or covered) for all other standard pressure filters.

Custom-made leaves and elements to your special design.

Screens—Strainers—Cylinders—Vibrating Screens

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Inquiries Invited. Write for Catalog

MULTI-METAL WIRE CLOTH CO., INC.

1356 GARRISON AVENUE

NEW YORK 39, N. Y.

Check 4596 opposite last page

CHEMICAL PROCESSING

NEW LITERATURE

Thermocouple gage and control, to provide direct and continuous indication of total pressure from 2500 to 1 micron absolute at either of two points, are featured in two-page Vacuum Gage Technical Data Sheet — NRC Equipment Corporation, A Subsidiary of National Research Corporation, 160 Charlemont St., Newton 61, Mass.

Check 4597 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

Agricultural chemicals and how they are used to protect our food, property and health is subject of 64-page booklet. A review of progress in man's mastery over pests of all types and future benefits expected through research and education are included. "Open Door to Plenty" may be obtained by writing direct to National Agricultural Association, 1145 Nineteenth St., N.W., Washington 6, District of Columbia.

Tractor-loader specifications, mechanical details, and photographs are contained in eight-page Bul CUS-110 — Utility Sales Division, J. I. Case Company, Racine, Wisconsin.

Check 4598 opposite last page.

Industrial-truck brakes — Bulletin details safety and control features of three independent brakes actuated by single toe-bar. Tri-Safe Engineering Bul — Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, Ohio.

Check 4599 opposite last page.

Waste treatment apparatus is discussed in 24-page brochure. Diagrams and installation photographs are included. Bul SM-1005 — Process Engineers, Inc., division of The Eimco Corporation, 420 Peninsular Ave., San Mateo, Calif.

Check 4600 opposite last page.

Electric cleaners and attachments are listed in six-page brochure. Electric cleaner brochure — Ace-Sycamore, Inc., 448 Dekalb Avenue, Sycamore, Ill.

Check 4601 opposite last page.

SAFE-SURE Liquid Level Control by LEVEL MASTER®

Here's your supply source for a complete line of standard and custom controls. Pictured is one of our Chamber Controls—an example of our broad line of standard units. We also specialize in custom controls of all types. The long-lasting magnetic proximity switch, incorporating a permanent Alnico V magnet, responds instantly to changes in liquid level.

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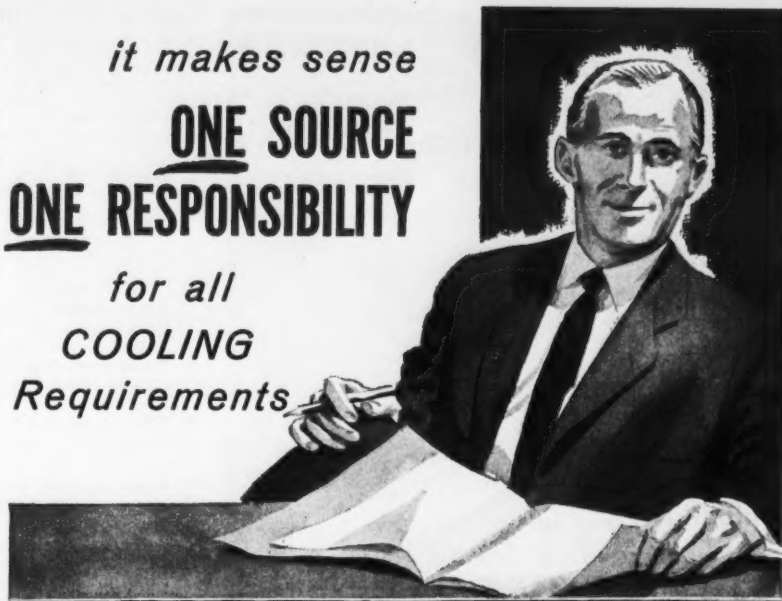
My name _____
Company _____
Address _____
City _____ Zone _____ State _____

Jo-Bell Products, Inc.
5456 W. 111th St., Oak Lawn, Ill.
Send full information on Level Master and name of nearest representative.

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MARCH 1959

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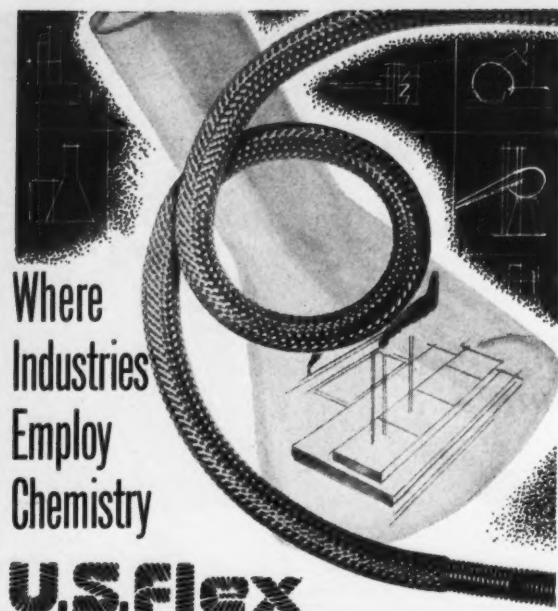
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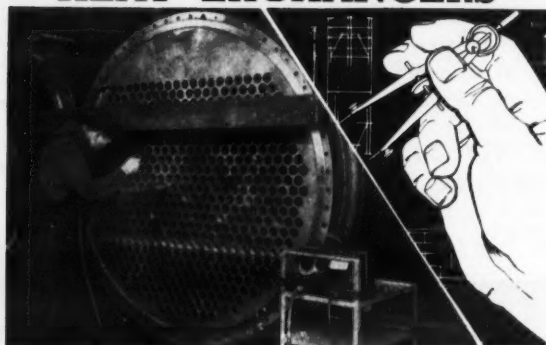
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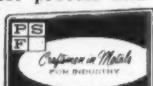
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Recirculation factor as an aid in designing industrial water-cooling towers is discussed in 12-page publication. Bul PFM-110 may be obtained by remitting \$1.00 to Cooling Tower Institute office, 420 E. Emerson St., Palo Alto, Calif.

Formaldehyde wall chart, formaldehyde specification brochure, and two seminar papers on handling and chemistry of formaldehyde are offered. Formaldehyde service aids — Borden Chemical Company, 350 Madison Avenue, New York 17, New York.

Check 4607 opposite last page.

Aerosol propellants — Vapor pressure tables and other useful technical information on Isotrons are contained in four-page bulletin. Also included are physical properties of five propellants. "Isotron Propellants" — Isotron Department, Pennsalt Chemicals Corporation, 3 Penn Center, Philadelphia 2, Pa.

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Flow meter, with metal tube and non-indicating electronic transmission for high-pressure applications up to 30,000 psi, is detailed in two-page Tech Bul 10A1159 — Fischer & Porter Co., 817 Jacksonville Rd., Hatboro, Pa.

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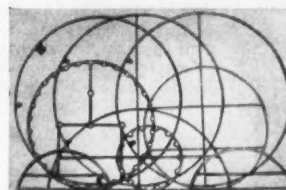
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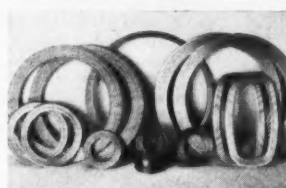
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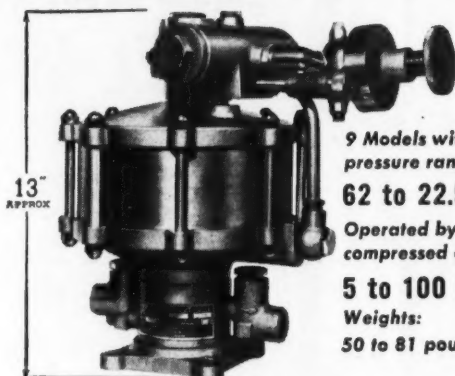
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MARCH 1959



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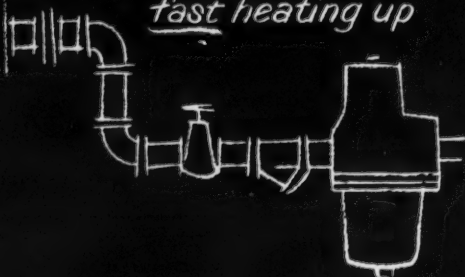
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STEAM TRAP CHALK TALK #1



EXAMPLE:

Use combination bucket
and thermostatic trap for
fast heating up



How proper trap selection increases heat transfer efficiency 35%

- It is of the utmost importance that the *correct* design of trap be used for each application. Standardizing on one design of trap for all applications reduces heat transfer rates up to 35%. As an example, for extremely fast heating up, a combination inverted bucket and thermostatic trap will shorten heat-up periods to 2½ minutes, eight times faster than conventional inverted bucket traps.

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*Sample price: \$126.00 for unit with 316 S.S. Bourdon tube, range 0-600 psi, proportional control 1-100%.

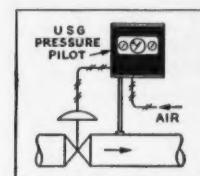


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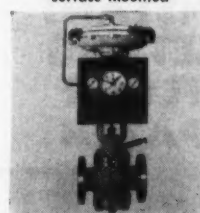
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Typical pressure reducing service

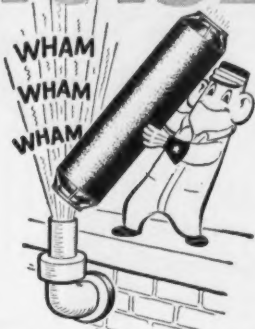


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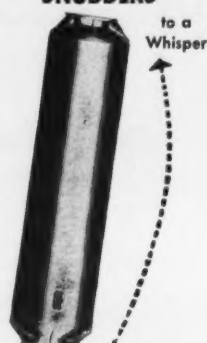


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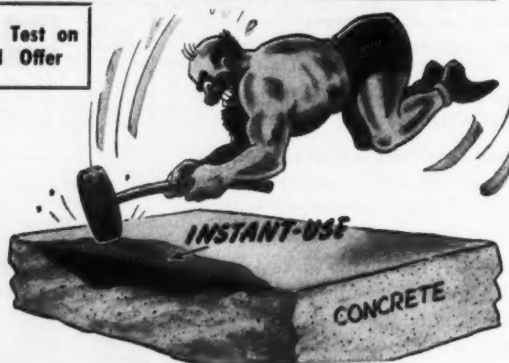
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PATCH**

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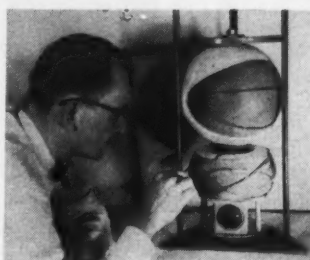


Check 4616 opposite last page



that's interesting

Thought-provoking slants
on projects and products



**Basketball takes
scientific bounce**

In the research laboratories of Standard Oil Company (Indiana), physicist Emil Banas is using a basketball to bend rocksalt crystals to increase the sensitivity of X-ray analysis. Force applied to the top of the basketball distributes the pressure just right to bend the fragile crystal over a heated mold without breaking it.

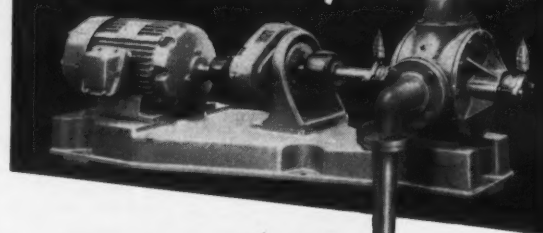
The curved crystal separates X-rays into a radiation pattern that reveals the kind and amount of chemical elements present in complex petroleum products. X-ray analysis gives fast, accurate check on product quality.

**Look tip top
with 'Tin-Tan'**

Now you can acquire a mid-winter sun tan without going to Miami Beach or Phoenix. As a matter of fact you can get it right in your own backyard by donning your bikini and lolling about in a portable box that collects the sun's rays.

Called the "Tin-Tan", the box collects the sun's rays to tan its lounging occupant gently while also keeping her comfortably warm in a bathing suit on a sub-freezing day. The secret is a surface of metallized "Mylar" polyester film on sides and 27 sq ft floor of the portable solarium. High reflectivity of material concentrates sun's rays and creates a "pool" of warmth within the two-foot high sides. It works on any sunny day.

Got a suction problem?



LET **BLACKMER**

SOLVE IT

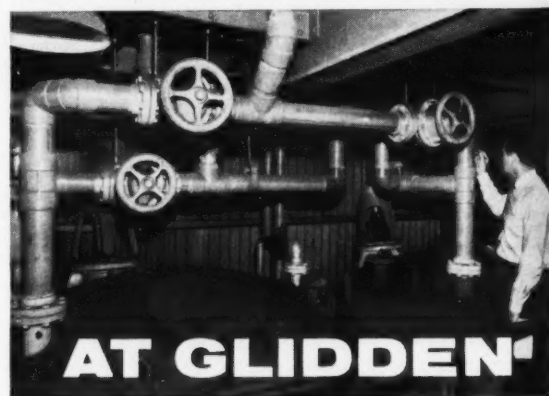
Because of their unique design, Blackmer self-priming rotaries have been successful for years in overcoming high suction lifts even with thick, sticky substances or with volatile liquids, where cavitation can be serious. Whatever your pumping problem, let Blackmer solve it. Write for Bulletin One.



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"liquids materials handling"® equipment
BLACKMER PUMP COMPANY, GRAND RAPIDS 9, MICH.
See Yellow pages for your local sales representative

Check 4617 opposite last page



Piping corrosion problem in handling 25% sulfuric acid has been solved with this UPVC system, equipped with ttp fittings and flanges. In Baltimore plant of The Glidden Company.

How you can stop piping corrosion



Complete information on UPVC (unplasticized polyvinyl chloride) piping to aid in design and installation given in Catalog 119. Also describes full line of ttp products... fittings, flanges, valves, specialties. Free on request.



TUBE TURNS PLASTICS, INC.
DEPT. CP-3, 2929 MAGAZINE STREET
Louisville 11, Kentucky

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Name	Title
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Company	Main Product
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2. Boeing	Aircraft, including commercial jetliners, military aircraft, and space shuttles.
3. IBM	Computers, software, and information services.
4. Rockwell International	Aircraft, spacecraft, and defense systems.
5. Lockheed	Aircraft, missiles, and defense systems.
6. Northrop	Aircraft, missiles, and defense systems.
7. McDonnell Douglas	Aircraft, missiles, and defense systems.
8. Grumman	Aircraft, missiles, and defense systems.
9. Boeing Defense, Space & Electronics	Defense systems, spacecraft, and electronic equipment.
10. Rockwell International	Aircraft, spacecraft, and defense systems.
11. Boeing	Aircraft, missiles, and defense systems.
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Waxing controversial

Contrary to manufacturer's claims, new car finishes do require waxing according to S. C. Johnson & Son, Inc. As a result of dealer inquiries and controlled panel tests, it was found that waxing and polishing is necessary to protect finishes from chalking and dulling on exposure to sun, humidity, road grime, etc. Johnson concludes that, although new auto finishes are better, they still need cleaning, waxing, polishing.

Sun-powered generator

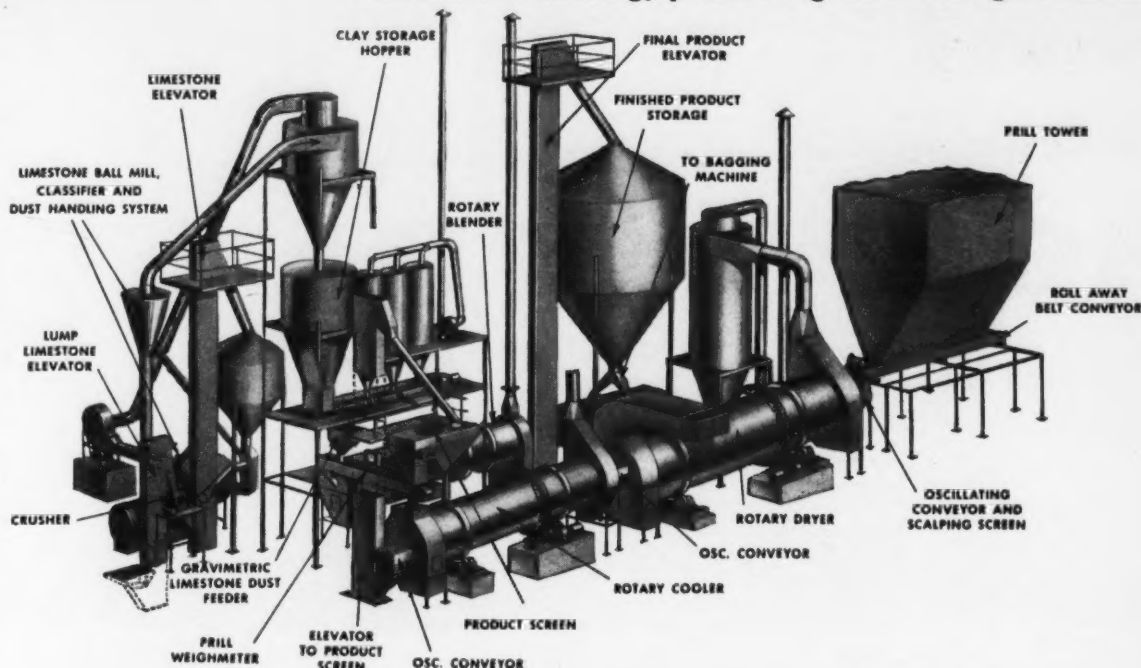
Solar-powered generator made with cadmium sulfide crystals has been developed by The Harshaw Chemical Co. Feature of unit is its imperviousness to heat. In lab tests it withstood 750°F before it stopped producing electricity.

For more information on product at right, specify 4619 see information request blank opposite last page.



DRYERS • COOLERS CALCINERS • KILNS

Individual units or complete systems including all materials handling; processing and storage facilities



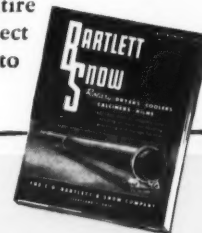
UREA PRILL DRYING AND PROCESSING SYSTEM

Urea prills having an initial moisture content of 2% to 3% are fed out of the prill tower — dried — cooled — screened — and weighed. After adding coating material in proper proportion the prills are passed through a blender to assure even, thorough coating. The finished prills are then conveyed to storage ready for delivery to the bagging machines. The major equipment units are mounted on one level for easy operation. The system is wholly enclosed, and kept under slight negative pressure to prevent dust loss. Fines are collected, and dissolved, in wet type dust collectors, and the liquor passed back to the prill tower for re-processing.

● For continuous or batch drying, calcining in a neutral, oxidizing or reducing atmosphere, roasting and all similar heat processing, call Bartlett-Snow. Our formula:—

- 1) More than 70 years experience.
- 2) An extensive research laboratory where any needed chemical or physical properties of the material can be determined. We can even produce samples of the treated product before the full scale plant equipment is built.
- 3) Widely known as designers and builders of bucket elevators, screens, bins and gates, conveyors, feeders and all other materials handling equipment. Thus we can supply — at no higher first cost — all the facilities for an entire system, assuring earlier completion of the project and fully synchronized operation according to plan. *Get full details!*

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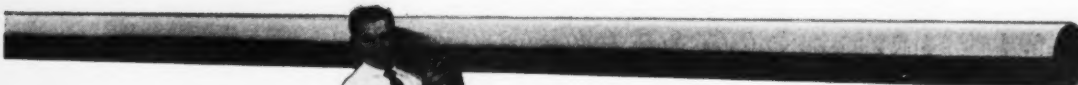
STRONG as steel pipe



...at one-eighth the weight!



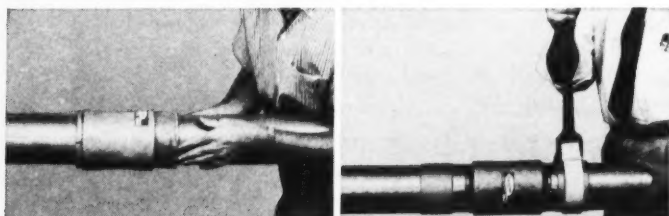
Circumferential Tensile Strength... 80,000 psi



BONDSTRAND®

*the revolutionary fiber glass
reinforced epoxy pipe
for corrosive service*

Here's a pipe that holds up indefinitely under the corrosive action of many salt, acid and alkaline solutions... that can't contaminate or flavor the piped material... that is rigid enough to resist sag, cold flow or deformation - flexible enough to follow normal ditch contours... that remains smooth and unclogged throughout its entire service life... that won't leak, even near its burst pressure.



Simple instructions with each shipment insure a perfect joint on the first try.



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Easy to install, with choice of locking wedge or threaded fittings.

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This means that you can use BONDSTRAND to transport corrosive solutions, waste water, sewage, oils, foods, beverages and many other troublesome fluids. It's also ideal for ducting, conduit or handrails where corrosive atmospheres, condensation, spillage or immersion cause troubles with ordinary pipe.

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LUXEMBOURG	
SWEDEN	Stockholm
SWITZERLAND	Geneva Zurich

UNION OF SOUTH AFRICA	Johannesburg
VENEZUELA	Caracas Maracaibo
WEST GERMANY	Hamburg

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